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HISTOLOGICAL VARIATIONS IN ANIMAL THYROIDS IN WESTERN CANADA

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FROM time immemorial it has been taught that goitre is a place disease. Geographical surveys with regard to the incidence of thyroid disease in the human have been carried out all over the world and well-marked goitre belts are now known. The type of thyroid depends on altitude, soil composition, quality of the drinking water, bacteriological purity of the water supplies, social and personal hygiene, and above all on differences in the quality and composition of the food supply.[1] A careful review of the literature, however, reveals no report on the study of the thyroid glands of various animals from a given area. The histological variations in dogs' thyroids have been studied many times.[5] Schlotthauer has studied the thyroid gland of horses, sheep and swine. In this publication we have endeavoured in our first report to study the thyroid gland of a variety of wild and domestic animals from the same district. We believe it to be the first survey of this nature.

Assuming that goitre is a place disease, a basic knowledge of the type of thyroid found in one's own locality, not only in the human but also in animals, is an essential for the proper understanding of thyroid diseases. It is necessary also to appreciate the normal physiological phases in the thyroid gland, not only at the age at which they are most commonly found but also from youth to old age. Otherwise, what is physiologically normal will be termed pathological, for there is considerable evidence now available to show that the thyroid gland undergoes definite changes as its age increases, and that possibly these changes are physiologically normal at that age, whereas in a younger gland they would be pathological.

Two years ago we began the study of the histological variations of the thyroid gland in various animals in western Canada. Up to the present time we have studied the thyroid glands of 667 animals, including young calves, yearling cows, sheep, foxes, mink, buffalo, horses and old range cows. As is shown in the list, these animals range in age from a few months, in the case of the calves, to many years, in the old range cows. Most of the material was obtained from the Harris Abattoir. These glands were collected by the authors personally on the floor of the abattoir. Each gland was placed in an individual can and preserved in 5 per cent formalin until ready for preparation for sectioning. In no case was there any opportunity for post-mortem change to set in. The buffalo thyroids were obtained from the herd at Wainwright, Saskatchewan. The fox, mink and horse thyroids were obtained from the Moose Mountain Fur ranches and the Klintberg Fur Ranch. These glands were collected from animals just as they were slaughtered. No note was made as to sex, menstrual phase, pregnancy, lactation, etc. Some of these phases will be reported upon in a later publication.

BASIC HISTOLOGY

In the very beginning one must establish a basic picture of what he considers the normal

microscopic histology of the thyroid gland. In this study we took the usual finding in a young human adult. The acini are rounded, slightly variable in size, and with regular walls. There are no interacinar twigs or projections. The stroma is scanty and supports very small blood and lymph vessels. The epithelial cells lining the acini are regular, low cubical, with small darkly-staining nuclei, and are arranged in a single layer. The stainable colloid is dense, homogeneous and stains uniformly and it sharply abuts on the epithelial cells.[2]

The study of each microscopical section was done in routine fashion, definite information being tabulated as to colloid content, vacuolation, cell type, tufting, presence of lymphoid tissue, amount of stroma and vascularity. In all these, with the exception of cells, we used the plus and minus system to designate the grade.

Colloid.—As colloid is normally present, we made xx the normal; 0 represented complete absence, and xxxx great distension.

Vacuolation.—In this too, 0 represented a complete absence. When any vacuolation was present, it was graded x, xx, and xxx.

Cells.—These were classified finally into three major groups, flat, cubical and columnar. A cubical or low cuboidal cell was considered normal; a flattened cell or columnar cell was considered abnormal.

Tufting.—Tufting was graded x, xx, xxx, xxxx plus, according to the degree present.

Lymphoid tissue.—This was found in so few animals that its presence was merely noted.

Stroma and vessels.—In these, we marked the normals as 0. If less than normal, it was classified -, - -, - - -, - - - -, etc., according to the degree of compression. If more than normal, it was classified x, xx, etc., according to the amount of increase.

After a careful study of each section with regard to the above components, we classified them as colloid, normal, or hyperplastic glands. In classifying glands as normal we found a moderately wide range in cell type, stroma and vascularity which we considered normal. Marine states that any gland in which the cells are higher than low cuboidal is hyperplastic, but our own observations do not support this view. We divided our normals into two types. (1) *Normal resting.*—These are characterized by low cuboidal epithelium, well-marked colloid distension, and a stroma and vascularity of no great prominence. (2) *Normal active.*—In these glands the cells are cubical, the colloid content is normal or slightly less than in the normal resting state. The greatest difference is in the interacinar stroma. This was well marked and contained numerous moderately distended vessels, giving the whole gland a very vascular active appearance. These glands appear to be in a transient stage, either progressing from a normal resting gland to a hyperplastic stage or reverting from a hyperplastic stage to the colloid stage. Whether progressive or regressive, we consider this a normal physiological phase and not pathological.

The glands that were considered hyperplastic were classified as 1 - 2 - 3 - 4 plus, according to the type of cell, amount of tufting and paucity of colloid. On the other hand those glands showing flattened epithelium, increased colloid, etc., were graded 1 - 2 - 3 - 4 colloid, according to the degree of change.

As stated earlier in this paper one of our problems is to show the transition of the thyroid from youth to old age. For this reason we shall deal with the younger animals first. At the same time we shall show how variable a picture one finds in the same type of animal under approximately the same conditions.

THYROIDS OF YOUNG CALVES

The first thyroids studied were those of calves about three months old. One hundred and

TABLE I.

HISTOLOGICAL STUDY OF ANIMAL THYROIDS

	Calves	*Yearling Cows*	*Mink*	*Fox*	*Sheep*	*Hogs*	*Horses*	*Buffalo*	*Range Cows*
Glands examined...	115	68	79	37	98	101	60	72	37
Normal rest.	66	34	11	11	46	32	21	24	3
Normal act.....	20	16	25	13	39	28	14	23	3
Colloid Goitre									
+	3	8	2	0	0	27	14	17	22
++	1	0	0	0	4	2	3	3	3
+++	0	0	0	0	2	2	0	1	1
++++	0	0	0	0	1	0	0	0	0
Hyperplastic Goitre									
+	15	7	31	13	3	3	8	4	0
++	9	2	4	0	2	4	0	0	3
+++	0	1	5	0	1	2	0	0	0
++++	1	0	1	0	0	0	0	0	0
Adenomatoses.....	0	0	0	0	0	1	0	0	0
Woody Thyroiditis.									1
Atrophy of age.....									1

fifteen glands were studied; of this number 86 were considered normal. (Table I). The acini were a little smaller than in the adult, but the colloid was well stained, the cells low cuboidal to cubical, and the interacinar tissue normal. Only 4 were classified as colloid and 24 as hyperplastic goitres.

A detailed study of the 115 glands is shown in Tables II and III. In 91 glands the colloid was normal in amount and this corresponds very closely with normal cuboidal cells in 89 cases. The stroma and vascularity was classified as normal in 65 and 63 cases, respectively, and slightly increased in 30 and 29 cases, respectively. A careful survey of the tabulated results shows that in these young animals normal or mildly active glands are the rule and that colloid goitre is the exception. On the other hand hyperplasia is moderately common, as shown by the incidence of 24 hyperplastic glands in the 115. Fig. 1 shows the chief histological variations found in these animals. We have found no other work on these animals to use for comparison.

THYROIDS OF YEARLING COWS

The next group studied were the glands of 68 yearling cows. These animals are termed "baby beef" and are animals in first-class condition. In this group 50 out of 68 were classified as normal active or normal resting glands. Ten animals had hyperplastic glands and 8 were classified as colloid goitre x. In the hyperplastic glands 7 were graded 1, 2 graded 2, and 1 graded 3. In 47 the colloid was normal in amount and in 57 the cells were cubical. The amount of stroma and vascularity was normal in 38 and 39, respectively, and slightly increased in 19 and 14, respectively. Tables II and III show all these details. Generally speaking, the glands from the yearling cows do not differ a great deal from those of calves, except that the acini are a little larger, which is quite natural on account of the increase in the size of the gland. Fig. 2 shows five microphotographs illustrating the great variation found. It is interesting to compare Fig. 2a with Fig. 1a. Both are classified as colloid one plus, but the acini in 2a are much larger than in Fig. 1a. Fig. 2e illustrates a very active gland, consisting of an almost solid mass of epithelial cells.

TABLE II.

HISTOLOGICAL STUDY OF ANIMAL THYROIDS

	Calves	*Yearling Cows*	*Mink*	*Fox*	*Sheep*	*Hogs*	*Horses*	*Buffalo*	*Range Cows*
Glands examined...	115	68	79	37	98	101	60	72	37
Amount of colloid..									
0	1	0	4	0	0	3	0	0	1
1	7	1	20	11	0	4	3	2	2
2	91	47	50	25	54	60	36	46	6
3	16	20	5	1	40	31	18	24	24
4	0	0	0	0	4	3	3	0	4
Vacuolation....1	0	0	3	8	1	1	3	0	0
2	1	0	1	6	0	1	0	0	0
3	1	0	0	1	0	0	1	0	0
Cell type									
Flat.....	2	1	3	0	5	7	17	5	5
Cuboidal.....	89	57	34	25	87	88	32	65	29
Columnar.....	24	10	42	12	6	6	11	2	3
Tufting.....1	7	5	11	0	1	2	3	1	1
2	7	1	4	0	1	4	0	0	0
3	2	0	0	0	1	3	0	0	0
4	1	0	0	0	0	0	0	0	0

TABLE III.

HISTOLOGICAL STUDY OF ANIMAL THYROIDS

	Calves	*Yearling Cows*	*Mink*	*Fox*	*Sheep*	*Hogs*	*Horses*	*Buffalo*	*Range Cows*
Glands examined...	115	68	79	37	98	101	60	72	37
Amt. of Stroma									
−3	0	0	0	0	1	2	0	0	0
−2	1	0	0	0	0	3	1	3	4
−1	3	3	0	0	9	28	13	16	19
0	65	38	29	10	51	48	18	46	3
+1	30	19	32	15	28	7	18	7	3
+2	15	7	18	12	8	10	8	0	8
+3	1	1	0	0	1	3	2	0	0
Vascularity....−3	0	0	0	0	1	2	0	0	0
−2	1	0	0	0	0	2	1	3	3
−1	3	3	0	0	6	29	14	16	24
0	63	39	29	10	44	51	25	43	10
+1	29	14	22	9	32	11	16	10	0
+2	19	11	22	12	12	6	4	0	0
+3	0	1	6	6	3	0	0	0	0
Lymph tissue.....			1	4					

THYROIDS OF MINK

Group III consists of the thyroid glands of 79 mink. These and those of group IV are most interesting. These glands were obtained from animals raised under ideal hygienic conditions. From the time of their birth until their demise they had been protected from all forms of fright, excessive exertion, and unhygienic conditions. Moreover, they had been fed a standard balanced diet, in the best quantities for the well-being of the animals' health. As a result, one would

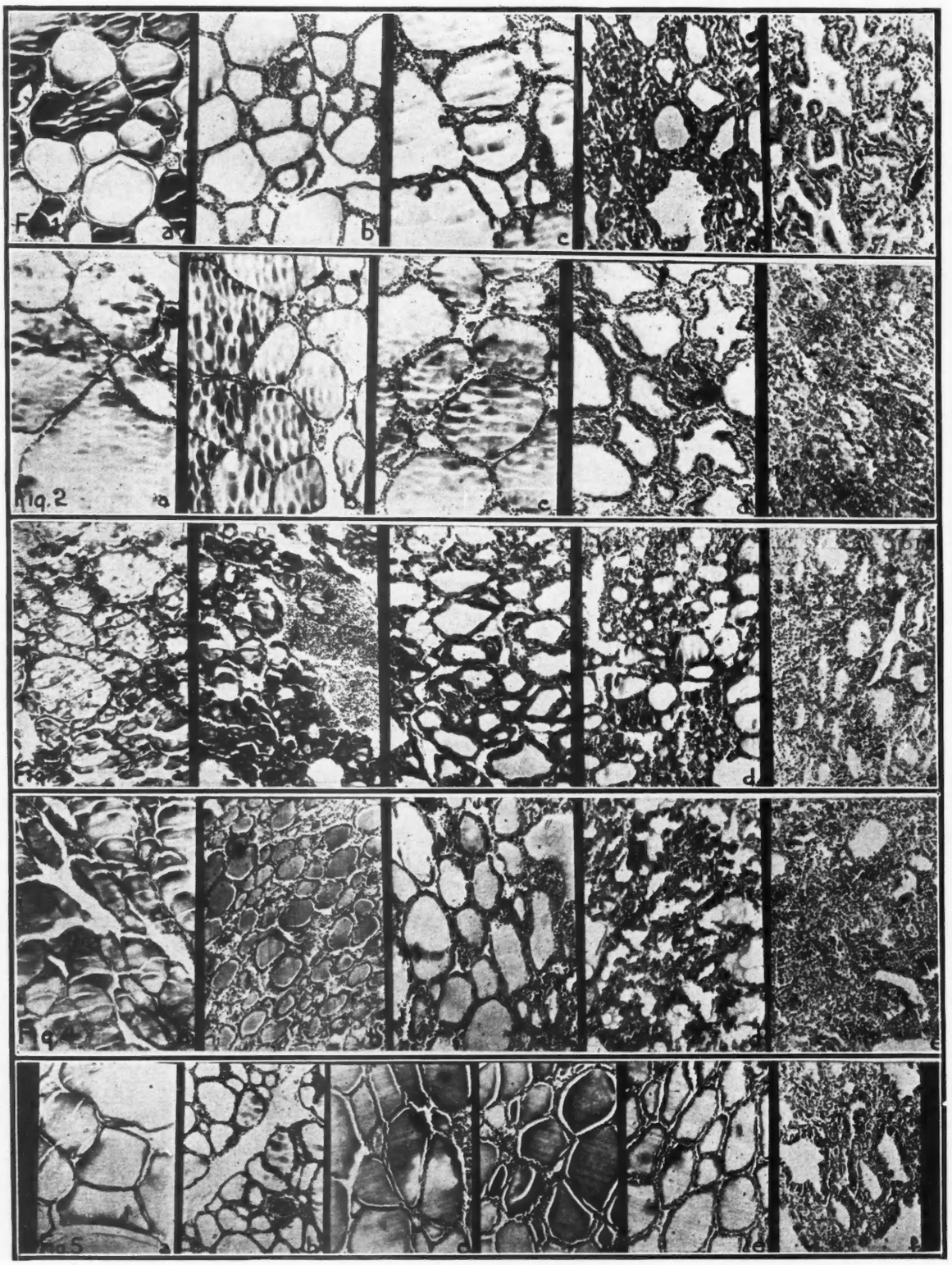

FIG. 1.—Histological variations in calves' thyroids.

(a) Colloid goitre x plus. The interacinar tissue is sparse, the lining epithelium is flattened, and the colloid is increased and dense. (b) Normal thyroid gland. (c) Hyperplastic thyroid x. The colloid is still well marked, the epithelium is columnar and early tufting is present. (d) Hyperplastic thyroid xxx. The acini are much smaller, the epithelium is columnar and the interacinar tissue is greatly increased. Tufting is not prominent. (e) Hyperplastic thyroid xxxx. Note the marked infolding of the epithelium and the tall columnar cells typical of exophthalmic goitre.

FIG. 2.—Histological variations in yearling cows' thyroids.

(a) Colloid goitre x. Note the large acini. The cells are not greatly flattened however. (b) Normal resting thyroid. (c) Normal active thyroid. Note that colloid is more abundant in (c) than in (b). The cells however in (c) are a little more cuboidal and the interacinar tissue much more marked, especially more vascular, indicating an active gland. (d) Hyperplastic thyroid xx. Typical picture of Graves' disease, with well-marked stroma, smaller acini, decreased colloid, tall columnar cells, and well-marked tufting. (e) Hyperplastic thyroid xxxx. The section consists of a mass of epithelial cells. The acini are so small that they are hard to distinguish.

(Continued on next page)

expect to find in these glands less variation than in any other. One other interesting fact is that these two groups are from carnivorous animals, in contradistinction to the rest of the groups, which are herbivorous.

In the group of 79 mink thyroids, 36 were considered normal, basing our normal on normal human histology; 41, or 51.8 per cent, were hyperplastic. Thirty-one of these hyperplastic glands were graded 1 plus; 4, two plus; 5, three plus; and 1, four plus. Two glands were graded as colloid goitre.

A study of Table II shows that in only 5 glands was the colloid increased. In 50 it was normal and in 24 it was decreased or absent. Vacuolation was present in 4. It will be noted that vacuolation is very uncommon in our animals' thyroids.

Tufting was present in 15, a much higher percentage than in the two previous groups. A corresponding increase in the amount of stroma and vascularity was also noted. In 50 out of 79 glands the amount of stroma was increased. Curiously enough vascularity increase was identical, although distributed differently. (Table III). The microscopic variation of minks' thyroids is shown in Fig. 3. Generally speaking, the acini are smaller than those examined heretofore, and the glands are more vascular, and more active in appearance. In Fig. 3b one sees the only lymphoid nodule that we discovered in our whole series. This is not a parathyroid.

THYROIDS OF FOXES

The thyroid glands of 37 foxes were examined. Fig. 4 is composed of 5 microphotographs of the histological variations. Generally speaking the acini are a little larger than those found in minks. Twenty-four glands were classified as normal active or resting, 13 were hyperplastic, and none were colloid. Fig. 4a is suggestive of colloid goitre, but the cells are quite cubical and the stroma normal. The amount of colloid was normal in 25, and decreased in 11. Vacuolation was present in 15, an unusually high percentage. There were no glands with flattened epithelium, 25 having cubical and 12 having columnar. In all cases the stroma and vascularity were normal or increased. One point of interest is the occurrence of 4 with lymphoid nodules. In no animals except the mink and fox were these found.

THYROIDS OF SHEEP

The next series consisted of the thyroid glands of 98 sheep. Fig. 5 is a series of microphotographs of the histological variations found. These sheep were young, and the histological study of their thyroids bears evidence of this fact. Of the 98 glands studied, 85 were classified as normal, 6 hyperplastic, and 7 as colloid goitre. (Table I). The amount of colloid was normal in 54 and increased in 44. The cells were normal in 87 out of 98, a very high percentage. The stroma was normal in 51, increased in 37 and decreased in 10. Vascularity followed a close parallel, being normal in 44, increased in 47, and decreased in 7. Lymphoid tissue was noticeable by its absence. Generally speaking, there was less variation from what we consider the normal in sheep than in any other animal. Fig. 5 illustrates this point very well.

THYROIDS OF SWINE

In swine the thyroid differs a good deal from the animals studied so far. The thyroid is a single centrally-placed gland (Fig. 6), just

(Continued from page 468)

FIG. 3.—Histological variations in mink thyroids.

(a) Colloid goitre x. (b) Normal active thyroid. The acini are relatively small as one finds in young animals. A lymphoid nodule is seen in this section. (c) Hyperplastic goitre x. The acini are larger and contain more colloid than (b). The cells however are columnar. This shows that cell type and amount of colloid are not entirely dependent upon one another. (d) Hyperplastic goitre xx. The acini are smaller, cells taller, colloid less, and the interacinar tissue more vascular. (e) Hyperplastic goitre xxx. Epithelial hyperplasia is well marked and there is marked infolding.

FIG. 4.—Histological variations in fox thyroids.

(a) Normal resting thyroid. The colloid is well marked and the cells cubical. (b) Normal active thyroid. The colloid is decreased, the cells are still cubical, and the gland is very vascular. (c) Hyperplastic goitre x. The acini are larger and colloid increased but the cells are columnar. The interacinar stroma is slightly increased. (d) Hyperplastic goitre xxx. There is well-marked tufting and tall columnar cells. (e) Hyperplastic goitre xxxx. Epithelial hyperplasia is tremendously increased. The acini appear to be almost obliterated but can still be seen here and there.

FIG. 5.—Histological variations in sheep thyroids.

(a) Colloid goitre xxx. The colloid is greatly increased, the acini large and the lining epithelium very flattened. (b) colloid goitre x. The acini are less distended but the epithelium is still flattened. (c) Normal resting thyroid. The acini are larger than in section (b). The cells are cuboidal however. (d) Normal active thyroid. The cells are a little fatter than in (c) but the whole section is more vascular. (e) Hyperplastic goitre x. The cells are columnar and the interacinar tissue increased. No tufting is present. (f) Hyperplastic goitre xxx. Characterized by lessened colloid, tall columnar cells, tufting and a great increase in interacinar tissue.

anterior to the thoracic aperture, in the angle formed by the carotid arteries and the jugular veins. It has one main blood supply, as shown by Caylor and Schlotthauer.[3] Numerous accessory thyroids are the rule. The microscopic anatomy however is similar. One hundred and one glands were examined, and 60 were classified as normal, 31 colloid, and 10 hyperplastic. The hyperplastic glands, however, were very hyperplastic. (Fig. 7). The amount of colloid present was normal in 60, increased in 31. Cubical cells were present in 88. Tufting was present in 10 per cent. The stroma was normal in 48 animals, decreased in 33, and increased in 20. The vascularity corresponded very closely to the amount of stroma, being normal in 51 animals, decreased in 33 and increased in 17. Fig. 7 clearly demonstrates the striking variation in the histology of these animals' thyroids, varying from colloid 3 to hyperplastic 3. Fig. 7g is a microphotograph of a particularly active gland, but, curiously enough, one sees an occasional well-distended acinus in it and some smaller acini.

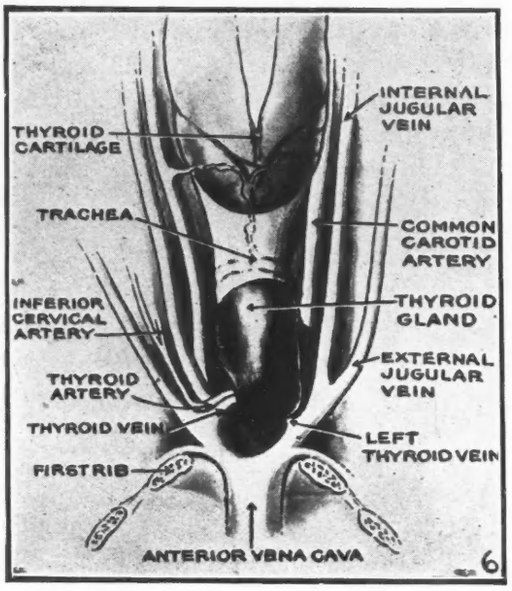

FIG. 6.—Picture of thyroid in swine. (After Schlotthauer).

Caylor and Schlotthauer[3] describe two anatomical types of thyroid in swine. In animals before puberty they found a predominance of cellular elements as compared to the colloid, columnar cells, small irregular acini, and well marked vascularity. This is a typical picture of exophthalmic goitre in man. In animals after puberty they found an entirely different picture. The colloid content is in great excess to the cellular elements, vacuolation is present, the cells are cuboidal to flat, and the acini are round or oval and of uniform size. They do not state the number of animals studied.

In our series all of which were after puberty, we find all grades of histological pictures from colloid 3 to hyperplastic 3. In our opinion age is only one factor in the histological variation, many other factors, such as menstruation, pregnancy, diet, etc., having possibly a profound effect on the activity of the gland. We do not think that one is justified in assuming that any one type of histological picture is characteristic of a pre- or post-puberty stage.

In the last three series of animals, namely, buffalo, horses and old range cows, we are dealing with old animals and one is struck by the difference in the histological appearances found.

THYROIDS OF BUFFALO

The thyroid glands of 72 buffalo were studied. These were all older animals killed for the purpose of keeping down the numbers in the herd. Forty-seven of the 72 were classified as normal, 21 were colloid goitre, and only 4 were hyperplastic, and those only mildly hyperplastic. The colloid was decreased in only 2 animals, normal in 46, and increased in 24. Fig. 8 is a series of microphotographs. These glands were very hard to cut owing to apparent calcification. The large amount of colloid can well be seen, especially in Fig. 8a. There was no vacuolation. In spite of the large amount of colloid only 5 animals had flattened epithelium, 65 had cuboidal, and only 2 columnar. Tufting was present in one. Increase of stroma was noticeable in its absence, and what was present tended to be of the fibrous type. Vascularity ran closely parallel.

THYROIDS OF HORSES

The thyroid glands of 60 horses, all killed for feed for foxes, were examined. Fig. 9 (a, b, c, d) consists of four microphotographs showing the histological variations in these animals. It will be noted that the meaty hyperplastic type of thyroid is missing. Thirty-five of the 60 glands examined were normal, 17 colloid goitre, and only 8 hyperplastic, and these 8 were graded one plus (Table II). The amount of colloid was normal in 36, increased in 21, and decreased in only 3. Vacuolation was present in only 4

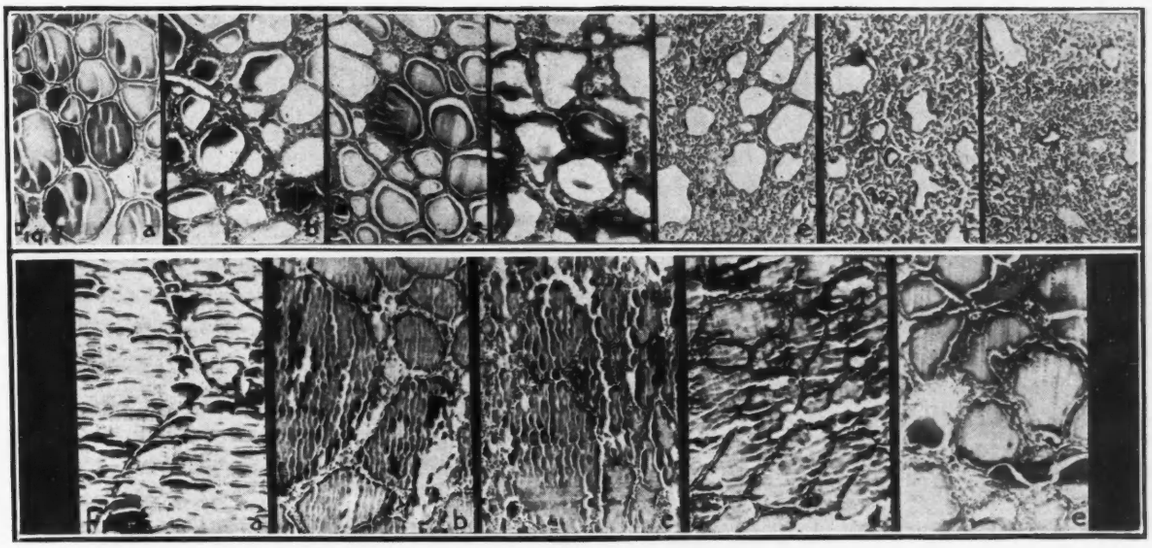

FIG. 7.—Histological variations in hogs' thyroids.

(a) Colloid goitre x. Colloid dark staining, and the lining epithelial cells are flattened. (b) Normal thyroid with fibrosis. The amount of colloid and lining epithelial cells are normal. There is a great deal of interacinar fibrosis. (c) Normal active thyroid. (d) Hyperplastic goitre x. Characterized by columnar cells, tufting, and increased interacinar tissue. (e) Hyperplastic goitre xx. The acini are smaller and the colloid is very thin. The lining epithelium is columnar. The striking feature is the amount of interacinar tissue. (f) Hyperplastic goitre xxx. The acini are smaller and are lined with tall columnar cells. Tufting and infolding is marked. The interacinar tissue is increased. (g) Adenomatosis. A very cellular gland characterized by a mass of small acini lined by columnar epithelium.

FIG. 8.—Histological variations in buffalo thyroids.

(a) Colloid goitre xxx. The acini are greatly distended with colloid and the lining cells are flattened to the extreme. Interacinar tissue is almost entirely absent. (b) Colloid goitre xx. Much the same as (a) but less extreme. (c) Colloid goitre x. The acini are much smaller and the cells are almost low cubical. There is some interacinar tissue. (d) Normal thyroid. The acini are normal. The interacinar tissue shows some fibrosis. (e) Hyperplastic goitre x. Colloid is still well marked. The lining cells are columnar and well marked tufting is present. The interacinar tissue is greatly increased and fibrosis is present.

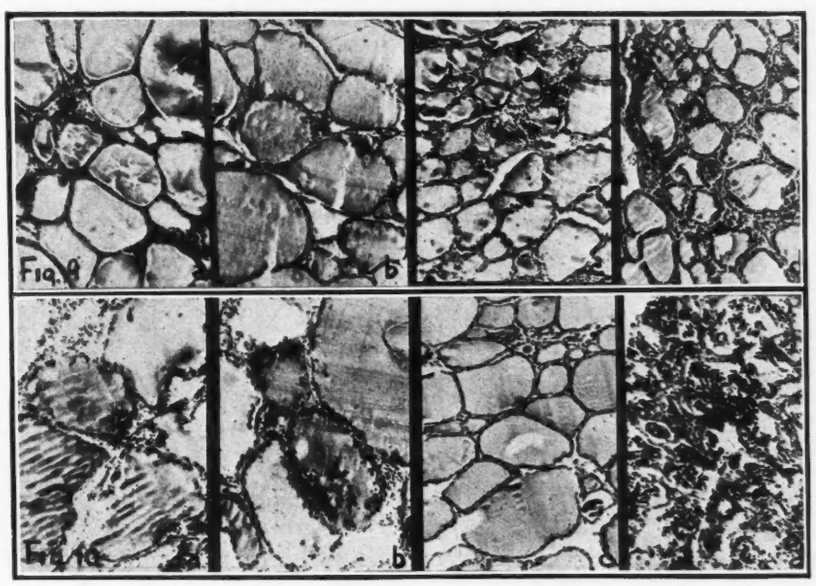

FIG. 9.—Histological variations in horses' thyroids.

(a) Colloid goitre xx. The well distended acini are lined by flattened epithelium. There is practically no interacinar tissue. (b) Colloid goitre x. The lining epithelium is not so flattened, and the interacinar tissue is not so scanty. (c) Normal active thyroid. The cells are cubical and the interacinar tissue is vascular. (d) Hyperplastic goitre x. No tufting is present, but the lining cells are columnar and the interacinar tissue is increased and vascular.

FIG. 10.—Histological variations in old range cows' thyroids.

(a) Colloid goitre xx. The acini are more irregular and are surrounded by some interacinar fibrosis. (b) Colloid goitre xx. The lining epithelium is less flattened and the interacinar tissue is greater in amount. Fibrosis is marked. (c) Normal thyroid. (d) Woody thyroiditis. Characterized by small scattered acini, fibrosis, and round-cell infiltration.

animals. The cells were normal in 32, flattened in 17, and columnar in 11. The stroma was definitely more marked than in any of the animals studied heretofore. In 28 thyroids the stroma was increased. The vascularity was increased in only 20. The characteristic thing in the stroma was the amount of well-formed fibrous tissue. This was very evident in the hyperplastic glands (Fig. 9d).

It is interesting to compare this study with the work of Schlotthauer[4] on horses' thyroids. He made a gross and microscopic examination of 100 horses' thyroids. They were 34 per cent normal (ours 58.3 per cent); 20 per cent were classified as hyperplastic (ours 13.3 per cent).

Nine had colloid goitres (ours 28.3 per cent), and 37 per cent were adenomatous. In none of our series did we find adenomata. He could find no evidence that sex made any difference, and found no adenomata present in horses under ten years of age. One point of interest was that 40 per cent of the animals with adenomatous goitre were in poor condition.

THYROIDS OF OLD RANGE COWS

The last series to be studied was the glands of 37 old range cows, or "canners". All these animals had seen better days, as shown by their thyroids. Of these only 6 were considered normal. Twenty-six, or 70.2 per cent, were classified as colloid goitre. Three were hyperplastic. One gland was classified as "woody thyroiditis" (Fig. 10d) and one as atrophy of old age. In only 3 of the 37 was the colloid decreased, and in only 6 was it considered normal; in 28 it was definitely increased. In none was there vacuolation present. Twenty-nine of the 37 glands examined had cubical cells as the type cell, in spite of the increase in colloid. In 5 the cells were flattened and in 3 they were columnar. Here again we found a great number of animals with little interacinar tissue, and that which was present was fibrous tissue. This was not dense and compact, but of loose texture. In some areas the acini were widely separated, and it was quite clear to us that this had not occurred during the process of preparation. Interacinar epithelial cells were very sparse, much calcification was present, and the whole general picture was that of a gland scarred by many battles and rapidly declining from the zenith of its power. Of the 37 glands examined, the stroma was considered normal in 3, decreased in 23, and increased in 11. Vascularity ran a close parallel, being normal in 10, decreased in 27, and in no case was it increased. (Table III).

COMMENTS

In a study of this character one must be allowed a moderate range of freedom in his histological classification or he will be lost in the intricacies and variations found not only in different glands but in the same gland. One of the stumbling blocks in scientific research on the histology of the thyroid gland is the fact that in one section it is not uncommon to see two or three entirely different histological pictures. One must therefore carefully study each section and choose the characteristic type-picture most widely found in that particular section.

No gross study was made of these glands as in the work of Schlotthauer.[4] However, in the preparation of these tissues certain very definite characteristics were noted. In the mink and the fox the thyroid glands were very evenly-sized. The glands were small reddish to pinkish red discrete bodies, having no isthmus connecting the two lobes. In no single case was there any sign of adenomatous formation. They resemble closely the thyroid glands of pups and kittens.[5] The gross study of all the other glands was identical with what one sees in any pathological laboratory. The glands varied considerably in size and consistency. Some were hard, firm and granular, as is characteristic of hyperplastic glands. Others were of the usual normal soft smooth colloid texture, while others were more firm, due to the distension of the acini with colloid. In none did we find adenomata, in marked contrast to Schlotthauer.

Several years ago it was quite a common thing to see experimental dogs in the Department of Physiology with large adenomatous goitres. In many animals the gland was so large that a tracheal cannula could not be inserted until the gland was resected. This is now a very unusual thing. The reason for this is possibly the widespread use of iodized salt in Manitoba, some of which naturally reaches the animals in their daily food.[6]

The term hyperplasia possibly varies with the individual research worker to some extent. In this work we began with the rule that no gland was hyperplastic unless the type cell was at least low columnar. Cubical cells were considered normal. Tufting was also considered a definite sign of hyperplasia. In this study we have noted many times that the cell is not entirely dependent on the amount of colloid. In many glands we found an overabundance of colloid and definite columnar epithelium, and *vice versa*. The possible explanation lies in the fact that when a resting gland characterized by considerable colloid and cubical epithelium becomes activated, first the cells become columnar, then vacuoles herald the beginning of absorption of colloid, and the next phase is possibly a hyperplastic picture characterized by columnar epithelium, mild tufting, and lessened or complete absence of colloid. Moreover, a columnar epi-

thelium to our mind does not necessarily mean a deviation from the normal, but in many cases merely a normal cell grown fat and tall to carry on the increased work which has been temporarily thrown upon it.

The colloid content varies with the activity of the gland, being plentiful in its quiescent stage. As age progresses its relative amount tends to become increased. The peripheral vacuolation means absorption, and in our opinion signifies that the gland is progressing from a quiescent to a more active stage in its physiological cycle. Vacuolation was not very common in our series.

Lymphoid tissue was conspicuous by its absence, as it was found only in foxes and mink. Warthin[7] believed lymphoid tissue to indicate a thymicolymphatic constitution. European workers, on the other hand, believe that lymphocytic infiltration in exophthalmic goitre is due to the pathological hyperplasia and hypersecretion of the thyroid itself. It is estimated that 66 per cent of thyrotoxic goitres show lymphoid hyperplasia and only 35 per cent of normal glands show the same findings. Wegelin,[8] after a very wide experience, comes to the conclusion that lymphoid tissue develops in the thyroid gland as a purely local response to chemical, mechanical or bacterial irritation, and that there is not any positive proof that it is due to a thymicolymphatic constitution. Rienhoff was the first to point out that lymphoid hyperplasia was less pronounced after the administration of Lugol's solution. This has recently been substantiated by Hellwig.[9] It is also stated that it is more common in the old than in the young, and more common in females than in males.[10] From this diversity of opinion, one is justified in assuming that little is known as to the significance of lymphoid tissue.

Vascularity was a very variable factor with no particular significance, except to indicate an active gland when present.

Stroma varied with age. Schlotthauer states that it is more common in herbivorous animals. Certainly in the hog the stroma was well marked, but generally speaking it increased with age, and, the older the animal, the more fibrous was its nature.

We therefore have here a microscopic study of the thyroid gland of a series of widely different animals at a wide range of age. In the younger animals hyperplastic active glands are the rule,[11, 12] and are physiological, not pathological. Small acini and little colloid is the characteristic picture. As age advances the acini tend to become larger varying in size and not in number,[13] colloid increases in amount, and we find a picture more like what we consider the normal gland. At an older age the colloid appears to be laid down in even greater quantity, the cells tend to become flattened, interacinar fibrous tissue increased, and the generalized picture is one of a gland past its prime, sluggish, and gradually declining to decay and death.

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THE SURGICAL TREATMENT OF FACIAL PALSY BY AN AUTOPLASTIC NERVE GRAFT*

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THE surgical treatment of most of the bones of the skeleton had long been scientifically and successfully carried out before the minds of surgeons were awakened to a clear perception of the fact that in disease of the temporal bone the same systematic surgical treatment was equally applicable and even more urgently called for. The earlier operations on the temporal bone lacked any real basis of anatomical and pathological knowledge and in consequence were halting in execution and failures in result.

The facial nerve in its long and devious course through the temporal bone is so deeply situated, and is surrounded by a bony tube of such ivory-like density, that usually it escapes injury during the mastoid operation. Yet, in far too many instances, neither timidity, on the one hand, nor boldness, on the other, has been successful in preventing the accidental injury of the nerve with its resulting appalling facial palsy. It has been pointed out that an intact nerve trunk is very resistant to surrounding suppurative processes, and that nerves may lie for many months in immediate contact with an active suppuration without functional impairment, while, on the other hand, the facial nerve is extremely susceptible to "compressive" lesions, due to the fact that in the tympanic and mastoid segments it traverses a bony canal which it completely fills and to which its sheath is intimately attached. Occasionally, disease of the bone itself may encroach upon the nerve so closely that the inflammatory swelling may cause paralysis; and, also, its operative removal, however skilfully attempted, may result in an injury of the nerve.

It is not my purpose to review technically the anatomy of the facial nerve, but in its course through the temporal bone the facial nerve possesses, from an otological standpoint, three separate roots, namely, the labyrinthine, the tympanic, and the mastoid segments. (See Fig. 1).

The labyrinthine segment enters the bone through the internal auditory meatus from the posterior cranial fossa, running from within outward in the horizontal plane between the cochlea and the vestibule ends in the geniculate ganglion. The nerve in this location is not accessible to injury during a mastoid operation. It then makes a right-angled turn at the genu commencing the tympanic segment, which enters the Fallopian canal on the internal wall of the middle ear just above and slightly anterior to the point where the ligament of the tensor tympanic muscle is given off for its attachment to the handle of the malleus, (Fig. 2). This ligament is a reliable guide to the position of the nerve during the radical operation. The tympanic segment runs directly backward and slightly outward through the Fallopian canal in the horizontal plane until it passes between the horizontal semi-circular canal and the oval window (Fig. 3); then it makes another right-angled turn, forming the mastoid segment, which runs directly downward in the vertical plane along the bottom of the posterior canal wall, leaving the temporal bone through the stylomastoid foramen at the mastoid tip.

In its horizontal course across the internal wall of the middle ear through the Fallopian canal, the nerve is covered by an extremely thin layer of bone, and is directly accessible to injury by the curette or undue pressure during the radical operation. Unless a very gross error in surgical judgment is committed, this portion of the nerve cannot be injured during a simple mastoid operation. The labyrinthine segment measures about 4 millimetres, the tympanic about 8 millimetres, and the mastoid segment about 7 millimetres. The average length of the facial canal in the adult is about 24 millimetres. The bend between the mastoid and tympanic segments is termed the pyramidal segment, and

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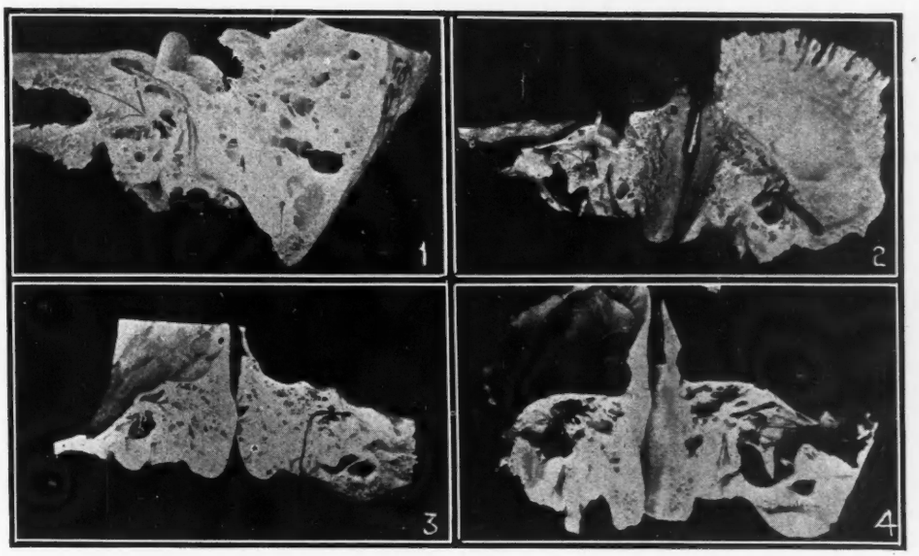
its average length is from 2 to 6 millimetres (Fig. 4).

When surgery of the temporal bone had so advanced that operators no longer feared to invade this particular region the results were twofold. On the one hand, there were those who were possessed of an extreme fear lest they should even touch the facial nerve. On the other, there were those who, fired by over-enthusiasm or over-confidence, were less cautious; consequently an ever-increasing number of cases of accidental facial paralysis resulted. Constructive efforts to repair the palsies resulting from these accidents were made by several men. Those of you who are interested in the history and development of the surgical treatment of facial palsy will find the classical work of that great observer, Sir Charles Bell, namely, "The Anatomy and Philosophy of Expression", published in 1822, a most elaborate and finished work on this subject. There were many others, but pre-eminent amongst them all stands Sir Charles Ballance, who in 1895 united the side of the spinal accessory nerve to the distal end of a divided facial nerve; later he employed the hypoglossal, the descendens noni, and glossopharyngeal. This method of anastomosis, with improving technique, was then employed throughout the world. Brilliant as were the successes in many of the reported cases, there remained always something to be desired. In nearly all the restoration was incomplete, the use of the muscles was always voluntary (an educated movement) and usually accompanied by associated movements, and the so-called "emotional response", *i.e.*, the reaction in the facial muscles to impulses from the centres in the brain was always lacking. The evidence of a facial palsy therefore has always stimulated every possible effort to relieve or cure the resulting grotesque appearance.

In 1930 Sir Charles Ballance, in collaboration with Dr. Arthur B. Duel, of New York, carried out some animal experiments to discover some method whereby the operative treatment of facial palsy might be improved. The details of these experiments are too lengthy for repetition in this paper, but abundant references to this subject can be found in current surgical journals. The practical outcome of this work, so far as it immediately interests otologists, lies in the fact that the experiments led the above-mentioned men to deprecate the anastomosis of the facial nerve with one of the adjacent nerves in the neck as the method of restoring lost facial function, and to advise instead the employment of an autoplastic graft, to bridge the gap from the proximal to the distal segment caused by injury or disease. The principles evolved from the animal experiments have been applied to the restoration of the facial nerve in human patients, and it has been finally demonstrated that a direct repair of the injured facial nerve may be made by the use of autoplastic nerve grafts. Many different nerves were employed, both motor and sensory, in any length desired, either reversed or unreversed; all these manœuvres were successful. The facial movements were



restored without any associated movements; moreover, emotional response, as well as voluntary control of the facial muscles, was restored. The following cases are presented.

CASE 1

R.B., male, aged twenty-five, with bilateral chronic purulent otitis-media for years.

Previous history.—He had had a mastoid operation on his right ear in July, 1933, and complete facial palsy immediately developed, (Fig. 5), with absence of the naso-labial groove and traction of mouth to the opposite side. The patient was re-admitted to hospital in October, 1933, when he presented the following features: (1) complete right-sided facial paralysis (meaning, paralysis of muscle, no response to the faradic current, and the reaction of degeneration present); (2) an operative mastoid scar; (3) chronic purulent otitis media; (4) a defect in the bone below the supra-meatal spine and encroaching on the posterior bony canal wall region, which was revealed by x-ray examination; (5) labyrinthine examination was negative; (6) eye grounds and spinal fluid, negative.

The operative technique requires a radical mastoidectomy; in addition, the removal of much of the floor of the osseous meatus (protecting the jugular bulb), knocking the tip off completely, and locating the nerve at the stylo-mastoid foramen as a preliminary to the Fallopian canal operation. In the words of Sir Charles Ballance, "Just as well surveyed water, though narrow and tortuous, may be safely and confidently navigated, so the surgeon, with his anatomical skill and knowledge gained in the deadhouse, may safely traverse the perilous narrow ocean of the operation on the Fallopian aqueduct. There is indeed only a narrow way going up to the top of the 'Hill Difficulty', and it is in that narrow way that the surgeon's feet should tread. On either side of the narrow way are two other ways, and the name of one is 'Danger' (the external semicircular canal) and the name of the other is 'Destruction' (the oval window)." Recently a slight modification or revision of the nerve-graft part of the operation has occurred. The long wait for results after the graft had been transplanted was very irksome. It has been well known over a long period of years that the distal segment of a divided nerve goes through a process of degeneration in which the active cells are broken down and the detritus removed by the circulation; the remaining empty tubules are then ready to conduct new neurons which grow in from the proximal segment. This degeneration must take place in the transplanted graft as well as in the distal segment. As a matter of fact, the graft becomes a part of the distal segment, behaving in the same manner, whereas the proximal segment does not undergo the process of Wallerian degeneration. The process necessarily goes on much more laboriously where the new circulatory apparatus in the transplanted graft is being reproduced slowly. It therefore seems reasonable to conclude that the degenerative process and the cleaning of the tubes will take place much more rapidly when the nerve which is subsequently to be used for the graft is allowed to remain *in situ* for a time after being severed. The process takes from two to four weeks. The graft material seems to be at its best in from two to three weeks. The tubules at this time have a strong attraction for neurons which are pushing in from the proximal segment. They pass through with almost incredible speed and on into the distal segment. Their eventual termination in the end-plates in the muscle fibres is heralded by a returning response to electrical stimulation. The nerve of choice for a graft is the anterior branch of the lateral femoral cutaneous nerve, (see Fig. 9, showing an intact nerve bundle stained by hæmatoxylin and eosin).

In the case of R.B. the nerve was prepared on November 6, 1933, under local anæsthesia, that is, the nerve was cut, the distal segment allowed to degenerate *in situ* for approximately twenty-one days (Fig. 10, a section stained by hæmatoxylin and eosin, showing degeneration of nerve bundle and inflammatory cellular infiltration around the nerve bundle, with beading of its neurilemma sheath).

A faint galvanic response was elicited in the muscles of the face, and it was considered therefore justifiable to operate. The radical mastoid operation was done, and the additional steps suggested above were performed carefully. Exploration of the mastoid within four months afterwards revealed an operative excavation in sclerotic bone in the posterior bony canal wall region, approximately three millimetres distal to the horizontal semicircular canal; this area later showed a mangled facial nerve. The proximal and distal ends of the nerve were recovered. The gap, as measured accurately by a divider forceps, was six millimetres. The bulbous proximal end was removed and the distal end cleaned and freshened. The nerve was decompressed five millimetres above the proximal end, and, of course, the entire distal segment had been previously decompressed. A nine millimetre graft was placed in the gap, the ends were accurately apposed without sutures, covered by a thin layer of cohesive dentists' gold and with the wound left wide open, packed with small bits of non-shelving edge packing wrung out of normal physiological saline. This was done daily. A plastic operation on the wound was performed six weeks later.

Fig. 6 shows the patient two months after operation, sitting up in repose, and Fig. 7, the patient in repose seven months after operation; Fig. 8, the patient closing the right eye seven months after operation.

It will be seen from a study of these photographs that there is: (1) A complete return in the tone of the muscles; the naso-labial groove is present, that is, the right side of the face is symmetrical with that of

the left. (2) On galvanic stimulation, polar inversion has become polar equality and is now decidedly stronger on cathodal closing of the current. (3) A voluntary movement of all the muscles on the right side, with the exception of the occipito-frontalis (this is the last muscle to recover), with the orbicularis oculi, the corrugator supercilii, the procerus, the dilator nares, the zygomaticus, the quadratus labii superioris, and the fibres of the orbicularis oris. (4) Tinel's sign is present, that is a sensation of electricity referred to the peripheal distribution of the nerve, a sensation of formication, which in the presence of other signs is of great diagnostic significance. (5) A returning response to faradic stimulation.

CASE 2

B.K., male, aged nineteen years, with a chronically discharging right ear for fifteen years; weakness of the right side of the face for fifteen years; and for six months prior to October, 1933, practically complete loss of movement on that side of the face.

Previous history.—A simple mastoid operation in June, 1919; a radical mastoid operation in March, 1920, with immediate facial paralysis, noticed on regaining consciousness; an operation in April, 1920, the character of which was unknown. During this time he had had electric treatments for his face.

Present history.—When the patient was seen in September, 1933, he presented chronic right-sided purulent otitis media; facial paralysis (Fig. 11). The x-ray showed an operative defect of the temporal bone. There was faint muscular response to strong galvanism.

Operation.—The anterior femoral cutaneous nerve was prepared, followed by an operation on the mastoid, which revealed an old mastoid wound filled with scar tissue and new bone formation. The middle ear was filled with débris and what appeared to be a large cylindrical mass. On completing the radical operation, and carrying out the steps as previously described, the operative finding appeared to be a neuroma of the seventh nerve, with a sessile base growing from its tympanic portion just proximal to the horizontal semicircular canal. The nerve was decompressed below, and its tympanic portion located by finding the remnants of the tendon of the tensor tympani muscle. The nerve was exposed up to and including the geniculate ganglion, and appeared to be atrophied both above and below this mass. Two sections were removed. Fig. 12 shows a section from the nodule on the facial nerve, using Weigert's stain which shows myelin sheaths black. There are very few nerve fibres seen embedded in the fibrous tissue. Fig. 13 is a section from the nodule on the facial nerve, removed at nerve level, using Weigert's stain, which shows a considerable number of degenerated nerve fibres embedded in the fibrous tissue.

The galvanic current was applied and no facial contraction resulted, but on approaching the neurilemma sheath on its inferior aspect some visible contraction was seen. The wound was left opened and the cavity re-entered a week later. After careful dissection the connective-tissue growth was removed in its entirety, but necessitated leaving a gap of approximately eleven millimetres, which occupied the bend or pyramidal segment. The graft was placed in position and the previously described procedures carried out.

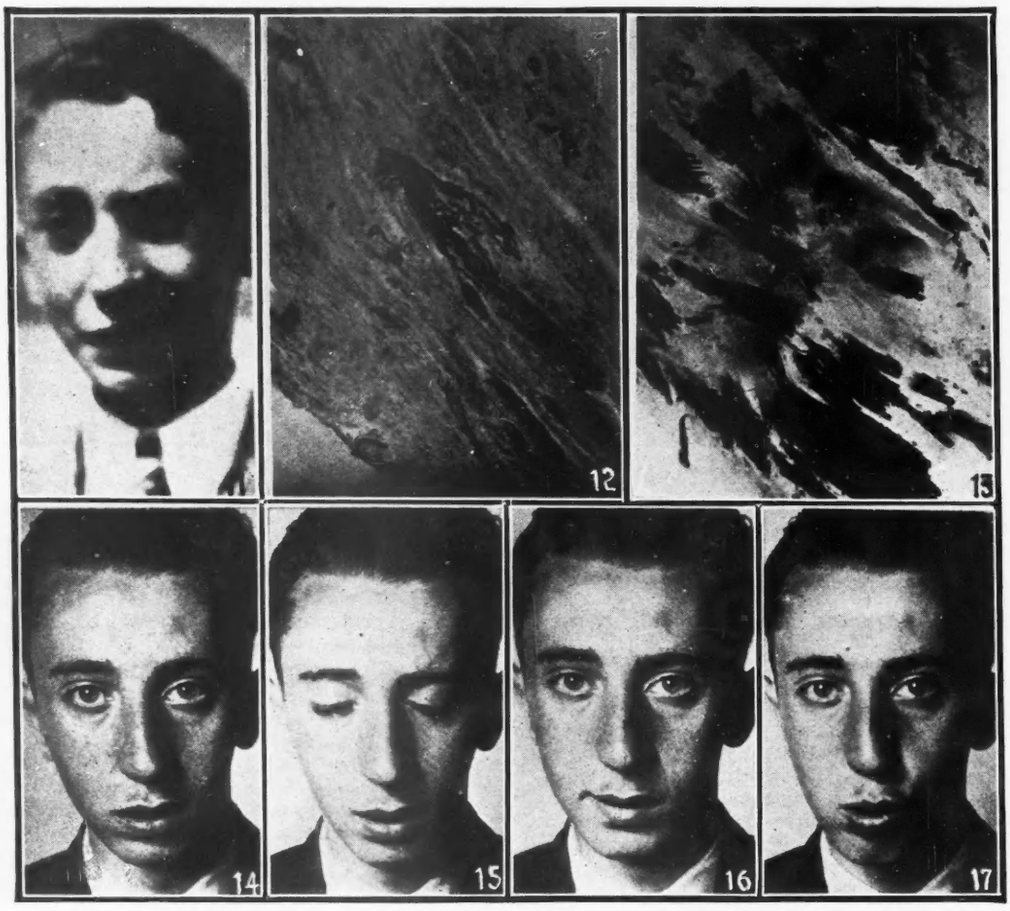
The following pictures demonstrate the return of power on the right side of the face nine months after operation. Fig. 14, the patient in repose; Fig. 15, the patient closing his right eye; Fig. 16, the patient elevating the corner of his mouth; Fig. 17, the patient whistling.

This work, although fascinating, definitely substantiates the oft-repeated surgical dictum that the results of an operation depend largely on the non-operative treatment. The almost irresistible tendency in surgery is to think or rather to feel that an operation has settled

everything, or that if it has not, it ought to have. This is utterly fallacious and misleading.

In the bibliography of articles dealing with facial palsy and its results, one invariably comes across the following statements: If after three to six months (sometimes longer) massage and electric stimulation should fail, exposure of the nerve or some anastomosis operation might be in order. Recent articles by Martin in *Archives of Oto-laryngology*, 1931, Fremmel in *Monatschrift f. Ohrenheilkunde*, 1930, Sewall, 1933, perpetuate this reasoning. Such psychology means hope, hope that recovery of the face will take place without operation (faint hope). The experience of actually seeing the extent of the injury in even a few cases of facial palsy following the operation on the mastoid has to me been illuminating. It seems that the difficulty in deciding on operation is that we do not know whether the nerve is crushed, divided, or merely involved in inflammation. In the words of Sir Charles Ballance, we do not want to know. The question of operation has little to do with how the paralysis was produced; the reason for the operation is that the patient has facial palsy.

In conclusion, such cases as I have shown point conclusively to the advisability of uncovering the nerve at once whenever facial palsy immediately follows an operation on the mastoid, in order to determine the extent of the damage. The rewards of such action are manifest. Compression or slight injuries may then be remedied by decompression, or inspection will disclose the fact that the accident has destroyed or damaged a longer segment of the nerve, as in Case 1. Immediate operation will permit a decompression of the nerve above or below the point of injury, averting the dire consequences of prolonged inflammatory compression, as in Case 2, or a suitable graft may be introduced to replace the damaged segment. It is much better to explore and determine immediately the nature and extent of the injury than to be harassed by uncertainty. In each instance outlined, to use a phrase popularized recently, the patient would have had "a better deal".



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ACUTE EMPYEMA IN INFANTS AND CHILDREN*

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"WHERE there is pus, let it out." This command has the authority of antiquity, but if it is to be intelligently obeyed in treating acute pyothorax in infants and children one might first enquire as to what method should be used, at what stage of the disease the removal should be attempted, and how much of the pus must be taken away to ensure a cure.

The time of operation.—As to the stage of the disease at which operation should be performed, it may be pointed out that delay is dangerous if the functional value of the lung is to be maintained. Pulmonary fibrosis begins early in a collapsed diseased lung, and it is permanent. The visceral pleura is engorged with inflammatory exudate, and made stiff and inelastic by the coating of fibrinous material; unlike the peritoneum, it never returns to normal. Healing of the abscess demands adhesion of the visceral and parietal layers through granulation tissue and fibrosis. If there is delay in re-expanding the lung the exudate may undergo premature organization, fibrosis, scarring, and become incapable of stretching. A still more important factor in urging early operation is the danger of extension of the inflammatory process, leading to such serious complications as spreading pneumonia, lung abscess, pericarditis, bilateral empyema. Of course it cannot be said with surety at just what stage of the disease the complications begin, but empyema is always a sequel of some previous trouble, and it is not logical to wait for the complications of the empyema to appear before beginning the treatment.

Contrariwise, excessive haste is a blunder. Consolidated lungs cannot be made to expand to take the place of the pus, and this fact becomes of importance whenever negative pressure is used in evacuating the cavity. Little is known regarding the effects of low pressure on consolidated pulmonary tissue, but one case in our series developed a bronchopleural fistula when a negative tension of 10 cm. of water was used. It is important to detect the presence of consolidation in a given case of empyema, but it is difficult to do so. X-ray examination is of no assistance, and auscultation and the temperature have to be relied upon. Frank blowing breathing and bronchophony are warnings against thoracotomy, but the appearance of coarse moist râles over an area of the lung that on previous examination showed blowing breathing and bronchophony, may be taken as an indication of the onset of "redux crepitus", and a signal that re-expansion may be hoped for, if the pus be gradually removed. Further, the danger of thoracotomy in the absence of adhesions between the lung and the chest wall is well known. The lessons learned in the epidemic of influenza in 1918 brought home the dangers of open pneumothorax in cases of total empyema when the pus was under negative tension, and the mediastinum displaced. The mortality was high when thoracotomy with rib resection was practised. It was then learned

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that by repeated aspirations adhesions would form between the visceral and parietal pleuræ, and the mediastinum become fixed to such a degree that thoracotomy could be tolerated.

The meaning of the term "mediastinal fixation" in a clinical sense is quite clear, but its mechanism from the point of view of pathological anatomy has not been explained. It may be established early or very late, or it may not put in its appearance at all during the course of an attack of empyema. This means that it is not possible to predict the effect on the mediastinum of sudden radical changes in the pressure on one side of the chest, and adds to the desirability of making all such changes in a gradual, slow, steady, deliberate manner. In different parts of the normal chest there exist various hydrostatic pressures, and their inter-relations, and variations in health and disease are complicated, but it is probable that the pus in total empyema is under a negative pressure, especially in the early stages. In the present series there were 3 cases, all due to the streptococcus, in which physical signs, x-ray appearances, and a negative hydrostatic pressure, all pointed to total empyema. By repeated aspirations (in one case numbering 14) the pressure was changed from negative to positive. In all 3 cases the pus changed from thin watery to thick creamy, and intercostal closed drainage was used with success. In all *encysted* or *partial* empyemas the pressure of the pus is positive, and thoracotomy can be undertaken with safety. Accordingly, it would appear to be wise to *postpone the operation until consolidation has disappeared and a positive pressure in the pus has been registered*, even though the delay carries with it a risk of the appearance of complications, and jeopardizes to some extent the re-expansion of the lung.

The amount of exudate to be removed.—The pus is not the disease; it is a sign that inflammation has passed that way, and its partial removal does not cure the patient nor guarantee against complications. Its volume must be reduced for mechanical reasons, to stop toxæmia, and to prevent complications, but there are several reasons for believing that it is not necessary to remove all of the pus, nor the mat of fibrinous exudate. In the first place, strictly total removal is not possible without decortication of the lung and scraping the chest wall. Secondly, some cases are cured by aspiration alone, and fluid cannot be completely removed by a hollow needle. Thirdly, intrapleural shadows are seen between the lungs and the ribs on x-ray films months and even years after clinical cure has taken place. These are referred to in the x-ray reports as "thickened pleura", but it is not certain that this term expresses the facts. In the fourth place, if a specimen of fibrinous mat from a pneumococcal case be kept in an incubator in a corked sterile tube, liquefaction begins, and is complete in a few weeks.

The principle adopted in the present series was that *only as much of the exudate should be removed as was necessary to permit the expanding lung to make contact with the chest wall.* No attempt was made to strip the fibrin from the surface of the lung, so that there could be no possibility of tearing the pulmonary tissue and causing a fistula.

The method of removal of pus.—As to the method to be employed it may be said that there are five requirements for a satisfactory operation for empyema, namely, relief of the symptoms, prevention of complications, avoidance of sequelæ, a high percentage of cures, and a low mortality.

The *symptoms* which demand relief are either mechanical or infective. The mechanical effects of the hydrothorax are due to displacement, compression and distortion of the mediastinum, and hampered diaphragmatic movements. They are dyspnœa, hyperpnœa, orthopnœa, cough, scoliosis, cardiac embarrassment. Those resulting from toxic causes are fever, malaise, septicæmia, abdominal distension. Before any operation can be considered a success it must relieve these symptoms rapidly, progressively and permanently.

The *complications* which have been noted in this series are,—empyema necessitatis, broncho-pleuro-cutaneous fistula, broncho-pleural fistula, suppurative pericarditis, bilateral empyema, multiple lung abscesses, and confluent bronchopneumonia. This list includes the mild associated conditions that were detected clinically and overcome, as well as the more serious pathological changes noted in the four necropsies on fatal cases. It is clear that once these complications are established they cannot be cured by an operative attack upon the co-existing empyema. In fact the gravity of any case of empyema does not depend so much upon the mechanical or toxic effects of the pyothorax as upon the complications, their number and gravity, and the ability of the patient to cope with them. It seems that the only defences that we possess

against the development of these dangerous complications are avoiding delay in the relief of the empyema, and in general supportive therapy. Operation should be carried out at the earliest possible moment, providing the consolidation has disappeared or is disappearing, but it should be delayed if the hydrostatic pressure of the pus be negative.

The *immediate sequelæ* that are to be avoided are pleural shock, and cardio-respiratory failure due to mediastinal flutter; the *later sequelæ* are open pneumothorax with chronic empyema, failure of the lung to re-expand, amyloid disease, scoliosis, osteomyelitis of the ribs, persisting sinuses, recurring abscesses. Of all this series of accidents the worst sequel that can occur in a case of acute empyema is chronic pneumothorax with failure of the lung to re-expand. Once a lung is collapsed for any length of time in the presence of purulent pleurisy and an opening in the chest wall, with or without broncho-pleural fistula, the patient is threatened with invalidism that may last for years. The accepted methods of dealing with the condition, even the relatively gentle practice of modern thoracoplasty, constitute large and disabling surgical procedures. It may truthfully be urged that open infected pneumothorax only rarely follows empyema operations, but with greater justice it may be countered that when it does appear it is a serious distressing lasting disability, and even a calamity.

Choice of operation.—The usual operations for empyema may be criticized according to the above five requirements. Rib-resection with open drainage is easy, quick, requires no special apparatus, and little further care, but it carries a risk of chronic empyema with infected pneumothorax, with its sequelæ, permanently collapsed lung, infected fistulæ, osteomyelitis of the ribs, if employed too early in the course of acute total empyema. Repeated aspiration alone has been advocated, but is uncertain, and the delay involved exposes the patient to the hazard of the development of complications.

The Fraser operation.—Wide exploration of the thoracic cavity through a long intercostal incision has been adopted by Fraser[2], the original wound being sutured, and closed drainage through a lower intercostal space being established. This operation was used with satisfaction in a series of cases, but it was thought to be rather severe, and it is doubtful if the thorough cleansing of the pleural cavity, which is the object of this extensive procedure, is necessary or even desirable.

Closed drainage has been the subject of much invention since its introduction by Bülau, Eberts and Graham, but a closed drainage system cannot be kept closed for any great length of time (leakage of pus occurs around the apparatus after a few days) and living tissues do not tolerate pressure. Expansible apparatus may be used to maintain an efficient closure, but the tissues may give way in the presence of infection. By the method described in this paper the efficiency of the closed drainage system may be maintained *for a minimum of five days* before the leakage of pus around the tubes spoils the closure. In one patient in this series the tubes were removed at the end of the twentieth day and no leakage of pus or entrance of air had occurred.

In view of the preceding theoretical considerations it seems to be desirable to *treat the empyema by surgical operation as soon as the pus is under positive pressure and signs of consolidation of the lung have disappeared, to remove just sufficient of the pus to allow the expanding lung to come into contact with and adhere to the chest wall, and to use a closed method that will re-expand the lung within a period of five days.* The time-limit is not set by the rate at which the lung will re-expand but by the minimum period of efficient closed drainage.

It is now three years since an attempt was made to satisfy these requirements by adopting the suggestions made by Denis Browne[1] in his paper on the treatment of empyema in children, published in 1930, and a brief description of the technique developed on the basis of Browne's work will now be given.

TECHNIQUE

It goes without saying that the operation is only an incident in the general conduct of the case, and no item in the general care is neglected. Aspiration of the pyothorax is carried out first, and is repeated until the pus registers positive pressure and the signs of consolidation have disappeared, or redux crepitus is present. For the actual operation the child is postured as shown in Figure 1, sitting across the table, leaning toward the healthy side, with the scapula held out of the way by extending the arm above the head. The ribs of the diseased side are separated by using a firm pillow in the opposite axilla. One per cent novocain solution is used as a local anæsthetic. One very excited child was given avertin by rectum with success. Drainage is carried out through that particular intercostal

space which appears to give the best drainage when the patient is nursed lying flat on the back. It is not necessary to select the lowest possible space, never, in fact, below the ninth, since the rising diaphragm may block an opening below this point. An incision, one inch long, is made over the rib below the space to be drained. The skin is then slid upward and the intercostal structures separated from the upper border of the lower rib. An exploring needle is used to confirm the presence of pus. The pleura is incised and the opening immediately plugged with the tip of a finger. Two mushroom catheters (Pezzar) are introduced into the empyema cavity, every precaution being taken to prevent the entrance of air. Two catheters are used in order that irrigation may subsequently be carried out, and to ensure an opening for drainage in case of the blockage of one of the tubes. Also, a manometer may be attached to one of the tubes to test the efficiency of the negative tension. The ends of the catheters are closed by screw clamps, which are not released until later. Gauze soaked in sterile liquid paraffin is tightly packed between the tubes, and the skin margins and the packing are transfixed by a large needle bearing a silk suture. The suture is tied between the tubes to provide an air-tight closure. About thirty strips of adhesive plaster, eight inches long and one inch wide, are then passed through an alcohol flame and adjusted to the chest between and around the emerging tubes.

The patient is placed on a Bradford frame covered with canvas in which a hole has been cut to allow the exit of the tubes. The frame is placed on two wooden supports, the one at the head being four inches higher than that at the foot. The tubes are passed through the opening in the canvas, and the ends submerged under the surface of a boracic acid solution in a sterilized jar. The level of the surface of the solution is kept at a distance of 10 cm. below the wound, in an attempt to create a normal negative tension in the chest cavity. When the pus is very thick this distance is increased. In the case of infants the frame is kept horizontal and the patient held in place by a canvas cover (Figure 2). Older children are given a foot rest fastened in the proper position to serve as a solid support, against which the feet can be pressed to prevent the child sliding downward on the frame. At the same time the foot rest keeps the bedclothes off the feet and legs. After the operation a few hours' rest are allowed, then one of the tubes is unclamped and the pus allowed to drain into the antiseptic fluid. When the pus is under a positive pressure it will pour out rapidly, and the clamps are closed at intervals and reopened for periods of increasing length of time, to allow slow emptying of the cavity. Each time the child breathes or coughs a small quantity of pus is forced out and the boracic acid solution prevents the entrance of air into the pleural cavity. If a bronchopleural fistula should be present, air will bubble from the catheter at each expiration. The patient may be turned and may sit up, providing the tubes are clamped whenever they are removed from the solution.

Irrigation of the cavity is begun on the second day. A sterile funnel is used in one of the tubes,

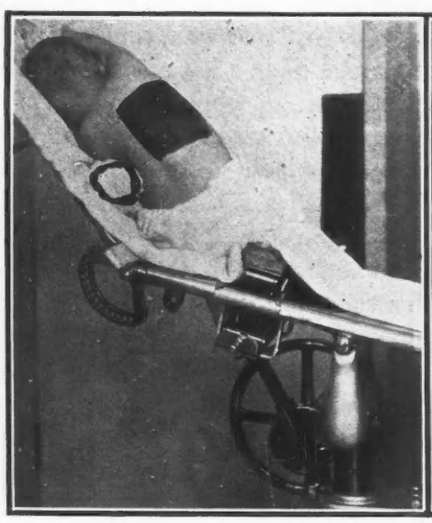

FIG. 1.—Infant on operating table, showing posture for intercostal closed drainage operation.

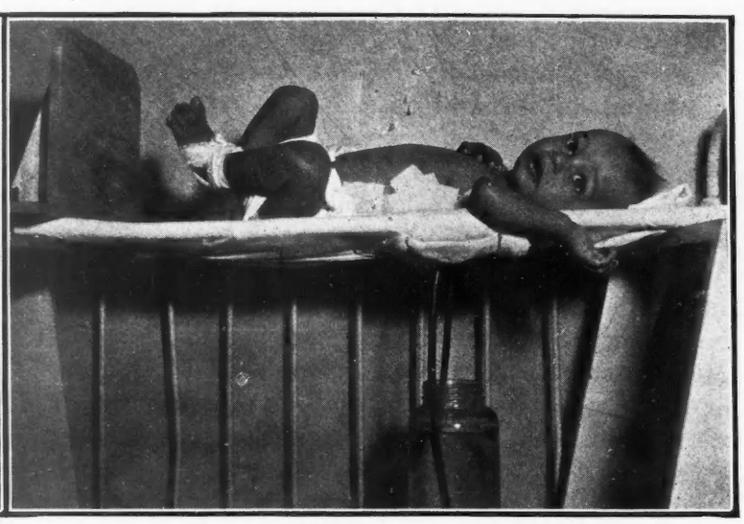

FIG. 2.—Closed intercostal drainage. Patient on Bradford frame with foot rest. Two Pezzar catheters emerging from the chest and entering a jar of boracic acid solution.

and warmed boracic solution allowed to circulate through the cavity under a head of two feet. The amount of pus in the bottom of the jar is noted each day. On the fifth day the tubes are clamped and x-ray examination made. If the pus has disappeared and the lung has expanded sufficiently to make contact with the chest wall, the tubes are removed, dry dressings applied to the wound, and pulmonary gymnastics begun with Wolfe blowing bottles. The wound is generally healed in about three weeks. If at the end of the five days, pus is still present the closed drainage is continued. After the tubes have been removed it is occasionally necessary to open the wound and insert a rubber tube for the drainage of recurring collections of pus. This can always be done with safety since the lung is rapidly expanding and the pulmonary gymnastics help to expel the purulent exudate.

TABLE I.

ACUTE EMPYEMA

Type of Operation and Mortality
November 30, 1930, to November 30, 1933

Number of Cases	*Operations*	*Deaths*
36	Closed Intercostal Drainage	4
1	Repeated Aspirations	0
1	Fraser Operation	0
1	No Operation	1
Total 39		5

STATISTICAL DATA

For the past three years, from December 1, 1930, to December 1, 1933, 39 cases of acute empyema have been treated in my service at the Children's Memorial Hospital (Table I). One patient died on admission before surgical treatment could be begun. One patient was cured by repeated aspiration of the pus. One case of encysted interlobar empyema was operated upon and cured by open thoracotomy through a large intercostal wound with closed drainage in a space below, and primary suture of the original incision (Fraser operation). The remaining 36 were treated by preliminary aspirations followed by intercostal closed drainage, with 4 deaths, no chronic empyema, no pneumothorax, no sinuses or fistulæ, and only one case of slight scoliosis. The most constant clinical sign was an area of persisting dullness through which the breath sounds and voice sounds could be heard, with

TABLE II.

DATA OF FATAL CASES

No.	*Initials*	*Sex*	*Age*	*Clinical Features*	*Autopsy Findings*
1	A.B.	Male	8 yrs.	Pneumonia, third week; empyema (right side); four aspirations; sudden pyopneumothorax; intercostal closed drainage; later—pleurisy on left side.	Pyopneumothorax, lung abscess and bronchopleural fistula; suppurative pericarditis (pneumococcus type IV. cultivated).
2	D.H.	Male	4 yrs.	Pneumonia, fourth week; empyema (left side); one aspiration (130 c.c.); died two hours after admission (no operation).	Pneumonia, grey hepatization of lower lobe and lower part of upper lobe; empyema (left side); pneumococcus cultivated.
3	P.K.	Male	5 mos.	Pneumonia, second week; empyema (right side); five aspirations; pneumococcal pus under positive pressure; no improvement; intercostal closed drainage; two blood transfusions; died seven days after operation.	Bilateral confluent bronchopneumonia; encysted empyema (right side); containing 10 c.c. of pus.
4	A.F.	Male	2 yrs. 6 mos.	Pneumonia, third month; pneumococcal pus (left side); intercostal closed drainage; consolidation appeared on the right side; consolidation reappeared in the left lung; blood transfusions; rib resection; death, two days later.	Multiple lung abscesses scattered throughout left lung, containing spirochætes, fusiform bacilli, and pneumococci.
5	P.D.	Male	8 mos.	Bilateral chronic suppurative otitis media and bronchitis; developed pneumonia (left) followed by streptococcal empyema; intercostal closed drainage; tubes removed in six days; sudden collapse three days later, with tidal air in wound (bronchopleuro cutaneous fistula); wound closed by strapping; fluid appeared in opposite side of chest; fluid aspirated; died eighteen days after operation.	No autopsy.

skodaic resonance over the lung above. The diagnosis was confirmed in every case by puncture with a hollow needle. There were 24 boys and 12 girls, the youngest being 5 months old, and the oldest 12 years.

The age distribution curve (Chart I) shows that most of the cases occurred in two groups, one from the first to the fourth year, and the other from the seventh to the ninth. The curve of the age-incidence of pneumonia in the same hospital for the same three years (Chart II) shows a steady decline as the years advance, without any evidence of the grouping found in the empyema cases. Comparing the two curves it may be noted that in the first year of life there were

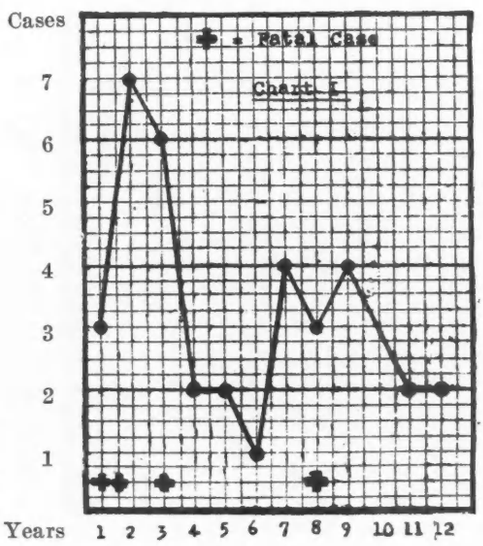

CHART I.—Age distribution of 36 cases of empyema.

many pneumonia cases (208), relatively few empyemas (3), but a high mortality (2). The early school years (ages 7, 8 and 9) showed no increase in pneumonia, but a distinct wave in the empyema curve, with one fatal case.

The average age of all the empyema cases was 4.8 years. Pneumonia preceded the empyema in 33 cases, and there were 3 streptococcal cases without pneumonia. The gravity of the syn-pneumonic form has been strongly brought forward in the literature, and is emphasized by the fatal cases in this series, two of which had pneumonia at the time of death, and two extensive post-pneumonic lung abscesses. Of the 3 cases due to the streptococcus, 2 showed an initial negative pressure of the pleural exudate. The chest was aspirated 14 times in one case, and 11 times in the other before the pressure changed from negative to positive and intercostal drainage was carried out with success. The empyema

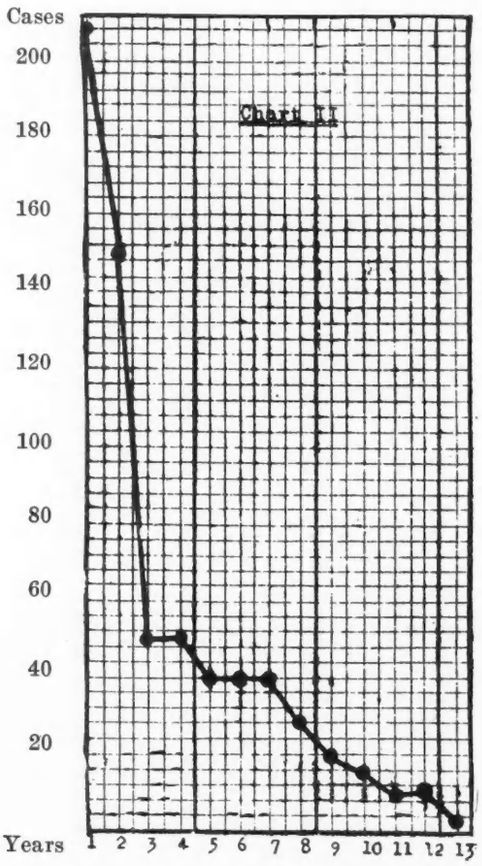

CHART II.—Age distribution of 699 cases of pneumonia, 1931–2–3, Children's Memorial Hospital.

was on the right side in 16 cases and in 19 cases in the left, in 1 case (fatal), it was bilateral. Twenty cases showed an initial positive pressure, and 8 an initial negative pressure, which eventually became positive after repeated aspirations.

A total of 113 aspirations were carried out, which is an average of about 3 for each case, the maximum number in any case being 14. A total empyema was thought to exist 3 times in the series. These 3 were children in whom the pus was under an initial negative pressure, and physical signs and the appearances in the x-ray films suggested that the whole pleural cavity was filled with fluid.

Regarding the bacterial culture from the pus, pneumococci were present in 28, streptococcus in 4, staphylococcus once, streptococcus and staphylococcus mixed once, and in two cases the organism was not identified.

The drainage catheters were kept in place for an average of nine days, the period varying from three to twenty. Only one patient developed broncho-pleuro-cutaneous fistula, and death followed. In another case a broncho-pleural fistula developed the day after intercostal drainage had

been established. The patient became suddenly dyspnœic, and air was seen to be bubbling through the antiseptic fluid with each expiration. The tubes were clamped for forty-eight hours, and then reopened. The fistula had apparently closed; there was no further bubbling of air. In 22 cases the wound healed rapidly and the patient was discharged. In 14 cases it was found necessary to reinsert a drainage tube to allow exit of a reaccumulation of exudate. In one instance a rib resection was carried out, but the patient died. At autopsy the lung was found to be completely filled with large and small abscesses.

An average of 39 days elapsed between the operation and the date of dismissal from hospital.

Only one patient in this series developed scoliosis. This was a case of encysted empyema in a boy, and on the day selected for intercostal drainage a large subcutaneous abscess appeared in the left pectoral region (empyema necessitatis). Instead of opening this abscess, intercostal drainage was carried out in the ninth space posteriorly. As soon as the pus was seen to be flowing freely into the jar of antiseptic fluid, pressure was exerted on the subpectoral abscess, and the pus forced back into the chest cavity. The empyema necessitatis never came to external opening. In this way two openings in the chest were avoided, and it was felt that a chronic open pneumothorax was thus prevented. The patient is left with a flattening of the chest in the left pectoral region and a scoliosis. With the exception of two who have refused to report for re-examination, the thirty-two living patients have all been re-examined in the Out-Patient Department, and checked by x-ray films. Some have been followed for as long as three years, the more recent ones only for a few months, the average duration of the follow up being 12.7 months. One patient developed pneumonia after leaving hospital but has made good recovery. Another had a minute discharge of pus on three occasions from the wound, but is now quite well. The remainder are healthy, and there have been no cases of chronic empyema, open pneumothorax, sinus or fistula.

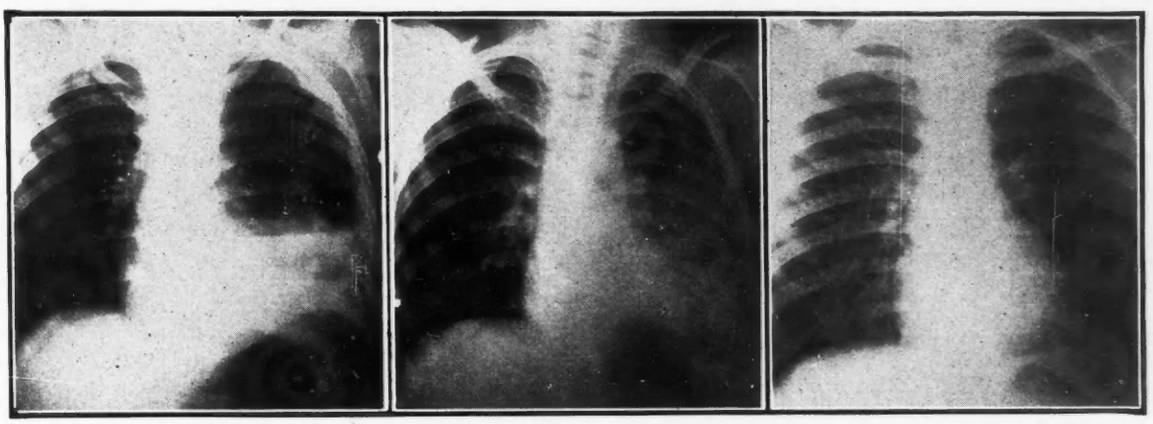

FIG. 3a FIG. 3b FIG. 3c

Skiagrams of a typical case of empyema treated by closed intercostal drainage. (Boy, aged 6).

FIG. 3a.—Condition on admission; heart displaced to right; fluid level; gas in the pleural cavity; partial collapse of the left lung.

FIG. 3b.—Eleven days after establishment of intercostal drainage the heart has returned to normal position; no fluid level; no gas in pleural cavity; the lung has expanded and is in contact with chest wall.

FIG. 3c.—15 months later; no abnormality.

CONCLUSIONS

In this series of 36 cases of acute empyema in infants and children it seems certain that 4 of the patients were doomed to die from lung abscess, pneumonia, pericarditis, or broncho-pleuro-cutaneous fistula, and no operation directed against the co-existing empyema could have influenced in any way the fatal outcome. In the remaining 32 cases, no grave associated disorder being present, cure was obtained by closed intercostal drainage under local anæsthesia, carried out as soon as the pus registered a positive pressure and the signs of consolidation had passed off. One patient developed a slight scoliosis.

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AN ATTEMPT TO INHIBIT THE DEVELOPMENT OF TAR-CARCINOMA IN MICE

(PRELIMINARY NOTE)

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BEFORE experiments on the inhibition of tar-carcinoma could be initiated it was necessary to obtain a stock of mice of known and fairly high susceptibility. Mice from several sources were interbred and the progeny tarred over a period of months, following the usual procedure (tarring twice a week with gas-works' tar). They were kept on an ordinary mixed diet which contained a moderate or low vitamin E content. Those developing papillomatous growths were mated early. Many of these mice developed carcinoma later.

As other investigators have noted, it was found that after definite carcinomatous growths had developed reproduction seemed to be inhibited. Nevertheless continued interbreeding of such papillomatous mice developed the desired strain; in any experiment with the young mice of this strain, prolonged tarring produced ultimately a typical carcinoma in 50 per cent or more.

The condition of the animals in whom a carcinoma had developed led to comparison with those suffering from avitaminosis E. The latter are weak, their hair becomes rough, indicating lack of normal health, their weight is conspicuously less than that of normal controls of like age, their sex-instinct is low or absent, and fertility is absent, through testicular degeneration in the male and death of the fetuses in the pregnant female.[1] Mice suffering from tar-carcinoma are also weak, seem smaller than the controls, and after a time growth appears to cease. The hair becomes rough. Both sex-instinct and fertility are low or absent. This is not due to a diet deficient in vitamin E, since in the majority of my experiments the mice were kept on the same diet throughout, and, as stated above, they were able to breed until a marked carcinomatous growth had developed.

The apparent parallelism suggested to me the possibility that deficiency of vitamin E and the carcinomatous condition induced by tarring produced general metabolic disturbances of comparable nature. Hence I was led to attempt to ascertain whether a diet unusually rich in this vitamin might at all inhibit the development of epithelial carcinoma in these animals.

In the earlier experiments, one group of rats of similar age was transferred to a diet of high vitamin E content (wheat cereal and lettuce, fortified by wheat germ oil) at some specific period after the cessation of 4 months' tarring, and was contrasted with a similar group of the same age and similar parentage (litters from the same father, related mothers). It became apparent that the first group remained in good health longer and tended to develop carcinoma later, while the incidence of carcinoma seemed to lessen. It was found definitely that these differences between the two groups became more marked the earlier the first group was transferred to the high vitamin E régime.

The following experiment typifies these results.

TABLE I

NUMBER OF DAYS BEFORE DEATH OCCURRED AFTER CESSATION OF TARRING

Group 9 Low Vitamin E Diet			*Group 16 High Vitamin E Diet*		
Mouse No.	*Days*	*Carcinoma*	*Mouse No.*	*Days*	*Carcinoma*
1	72	Present			
2	78	Present			
3	81	Present			
4	92	Present	(During this period no mouse of this group died).		
5	97	Present			
6	105	Absent			
7	107	Absent			
8	108	Present			
9	112	Absent			
10	132	Present	1	132	Present
11	132	Present			
12	136	Present	(All the other mice of this group were still alive on the 171st day. Growths are present on four, and are stationary or only progressing very slowly).		

Group 9, (control group).—Twelve female mice of the same age, offspring of the same male parent but of different mothers, were kept on the same ordinary diet throughout the experiment (containing at least sufficient vitamin E to permit breeding in normal animals). They were tarred for four months, commencing at the end of the eighteenth week of age. At the end of the tarring period all had developed papillomatous growths.

Group 16, (high vitamin E group).—Eleven females of the same age and the same degree of relationship were treated at the same time and in precisely the same fashion as those of Group 9, except that two weeks after the *commencement* of tarring they were placed on a diet rich in vitamin E. At the end of the tarring period only two had developed papillomatous growths.

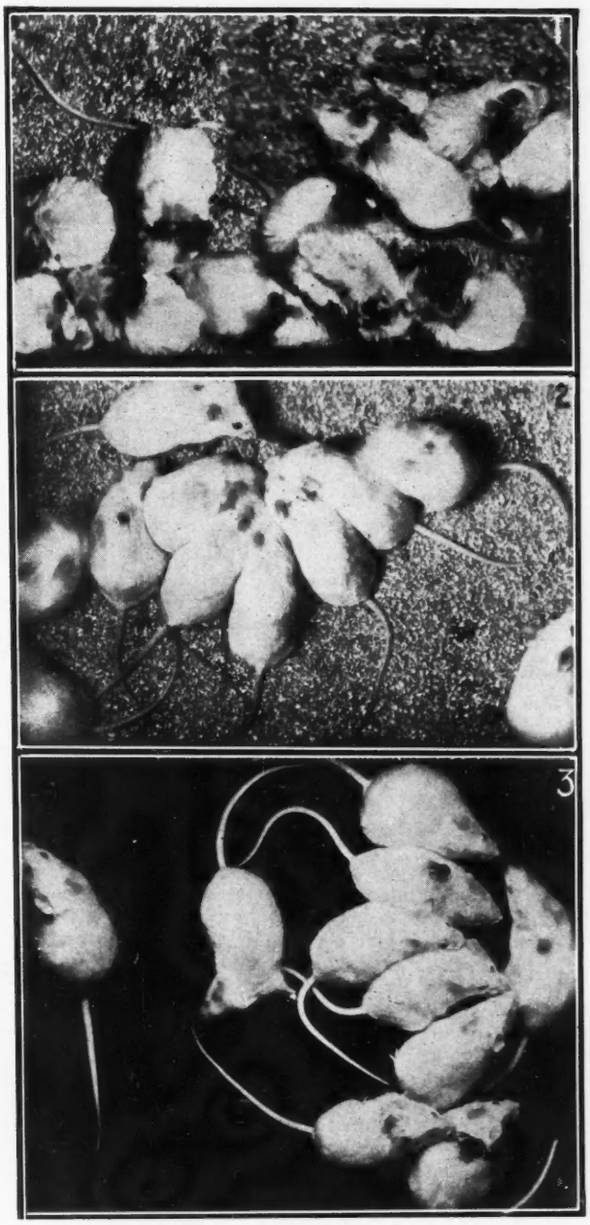

FIG. 1.—Group 9 at 66 days after discontinuance of tar treatment. These mice are cachectic and weak, their hair is rough, and the majority show large dark cancerous tumours (later verified microscopically at autopsy).

FIG. 2.—Group 16 at 75 days after discontinuing tar treatment. The mice are well-nourished and active. Two show papillomatous growths, one of which later became malignant.

FIG. 3.—Group 16 at 143 days after discontinuance of tar treatment. One has died (carcinoma present). The appearance and condition of the others is very similar to that in Fig. 2.

The late history of these two groups is shown in Table I. The mice are numbered in the order in which death occurred.

Fig. 1 shows Group 9 at 66 days after discontinuing tar treatment. Fig. 2 shows Group 16 at 75 days after discontinuance of the tarring. The difference in the two groups is obvious. Fig. 3 shows the remaining 10 animals of Group 16 at 143 days after discontinuance of tarring. At this period all the animals of Group 9 were dead (9 of the 12 with carcinomatous growths).

Breeding experiments with similar groups have shown that those on the high vitamin E diet have at least almost normal fertility as compared with the marked depression or absence of fertility in tarred groups on normal diet.

Details of these experiments will be reported subsequently.

I recognize that, even if the results now reported should be confirmed, they will not necessarily apply to other types of animal cancer, such as Jensen's carcinoma in the rat, or Rous' chicken sarcoma, let alone to human neoplasms, and, further, that the precise factor causing an apparent inhibition in the development of the tar-carcinoma in these mice has not been determined. It may be some other constituent of the wheat-germ oil or of the other foodstuffs fed. Nevertheless, high content of vitamin E is the outstanding and unusual feature of the diet, and this suggests that further work should initially test out the hypothesis that the inhibition is due to the excess of this vitamin. The work is being continued from this viewpoint.

I desire to acknowledge the kindness of Dr. Sara Meltzer, Assistant Pathologist of the Winnipeg General Hospital, in carrying out the histological examination of the growths.

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VILLOUS PAPILLOMA OF THE RECTUM

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VILLOUS papilloma of the rectum is one of the rarest of the benign intestinal tumours. In approximately 1,000 patients seen in the Proctologic Clinic of the Hamilton General Hospital and the clinic at the Mountain Sanatorium only three papillomata of any type have been seen, and only one villous papilloma. This case will be described. Although they are apparently very rare one imagines that they may have been wrongly diagnosed and called adenocarcinomata, as the one about to be described was by one laboratory.

These tumours vary in size, some being quite small, others as large as a cauliflower. They are not usually pedunculated and have a more or less broad attachment to the rectal wall. The surface is villous in character and the finger-like processes if placed in water will float. Sometimes they are very finely lobulated and show a typical structure microscopically. The tumours are reddish grey in colour, and very soft and spongy, breaking up with the slightest manipulation. There is usually no induration at the base and the tendency to recurrence is very remote.

The microscopic picture is fairly typical. The connective tissue branches and rebranches, and is covered entirely with high columnar epithelium. At the base, adenomatous areas are frequently found, and cystic acini occur. Between 12 and 20 per cent, if neglected, will become malignant. All papillomata should be considered pre-cancerous lesions.

They nearly always occur in adults, although some authorities state that they have existed from childhood and have grown rapidly larger in adult life. Bleeding is the most outstanding symptom and may occur at any time. The blood is usually mixed with mucus, due to the large area of secreting cells covering the long finger-like processes. When the tumour is very large mucus continually streams from the anus. When the tumour is very low it may prolapse through the anus, and if very large may even grow outside. Villous papillomata have a very low grade malignancy, and unless they become actively malignant, which is not probable, they do not metastasize. As the tumour enlarges in the rectum it becomes infected, and the infection spreading throughout the peri-rectal tissue may cause death.

The treatment, of course, is radical. The tumour should be removed completely, if possible, before infection has invaded it. These growths are ideal for removal by electrocoagulation, even if malignancy is proved, although radical excision may be undertaken or radium used.

The following case illustrates very well a typical villous papilloma, as well as the serious consequences following the careless neglect of good medical advice by a curable patient.

CASE REPORT

G.M., male, aged 56, was referred to me on March 11, 1933, complaining of bowel trouble. He had been examined for the first time two years previously by a surgeon who told him that he had a small growth in the rectum which might be very serious and should be excised immediately. Four years before this he had what he describes as "bleeding hæmorrhoids", and used some kind of ointment. Since the surgeon saw him two years ago he had consulted no less than four doctors who gave him the same advice. Six weeks before I saw him he had lost a considerable amount of blood and occasionally passed quite large clots. He stated that he had lost little if any weight, that his appetite was good, that he was paler than normal, and felt a little weak. He certainly looked pale, but physical examination, generally, showed him to be in good health. His hæmoglobin was 75 per cent and red blood cells 4,100,000.

By proctoscopic examination a fungating fragile tumour was seen in the ampulla of the rectum. This bled on the slightest manipulation, and during the examination quite a large section fell into the proctoscope. He was again advised that he should be treated surgically, immediately. This advice he ignored and returned again on April 11th, when practically the same appearance was noted. One did not hear of him again until some friends advised me that he was in bed under the care of a physician. I saw him there shortly afterward, and by that time, six months after my previous examination, he had developed peri-rectal infection with infiltrating abscesses in both buttocks and was under morphine most of the time. I saw him again a few days before his death and he was a shadow of his former self. Projecting from the anus was a large reddish-grey villous mass as large as a cauliflower (Fig. 1). It was dripping mucus and blood, and foul-smelling pus exuded from its surface.

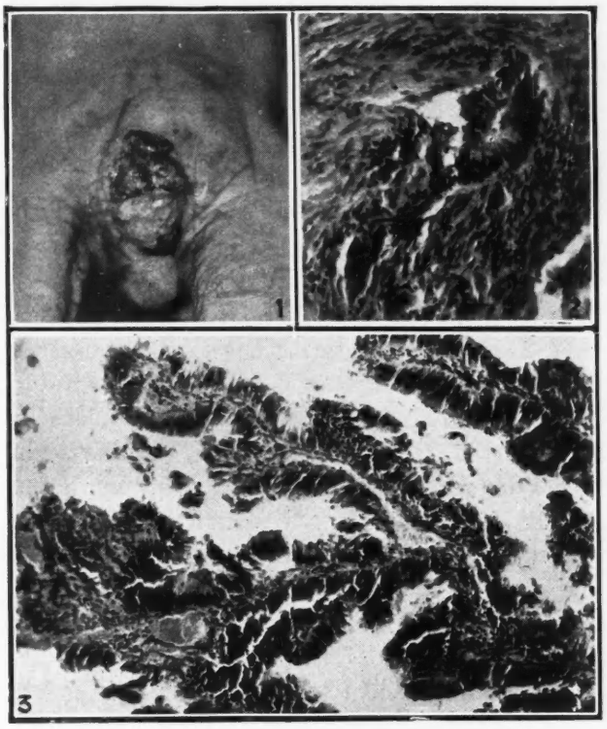

FIG. 1.—Papilloma projecting from the anus.
FIG. 2.—Sub-mucosal infiltration of tumour.
FIG. 3.—Showing villous type of tumour.

A partial necropsy was interesting, in that no metastases were found anywhere. Even the glands draining this area, although enlarged from the inflammatory condition present, showed no malignancy. Microscopic study showed the long finger-like processes lined with columnar epithelium peculiar to villous tumours of the rectum. Only after a protracted search one found a few small areas of sub-mucous infiltration.

Diagnosis.—Villous papilloma of the rectum; early malignancy.

COMMENT

Comparatively few, less than 100, tumours of the type illustrated in this paper have been reported in the literature. This was undoubtedly, in the early stage at least, benign. Even later, when it had enlarged considerably, but was not wholly obstructive, and when there was little infection present, it could have been removed successfully. The direct cause of death in this case was infection and toxæmia and not cancer, as has been reported, one imagines in many cases, where a fine enough line has not been drawn in the laboratory diagnosis.

Another tragic death due to carelessness or indifference on the part of the patient is described.

THE VALUE OF GLUCOSE IN SURGICAL AND MEDICAL CONDITIONS AND ITS MODE OF ADMINISTRATION*

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THE use of glucose as a therapeutic measure in almost every branch of medicine has become such a widely accepted procedure that we are apt to forget that this practice is virtually a growth of the past twenty years. Its value first became appreciated following a wider knowledge of fluid balance in the body, and has steadily been enhanced by recent biochemical and metabolic studies. In modern surgical practice the use of glucose is of cardinal importance, and probably more than any other factor has improved the pre-operative and post-operative care of the patient. In particular, the remarkable therapeutic value of glucose in hepatic and gall-bladder disease has led us to review certain aspects of its use in surgical and medical conditions, to evaluate its action under these circumstances, and to determine the mode of administration which gives the best results under the various conditions in which it is employed.

Glucose is a monosaccharide, the aldehyde derivative of a polyatomic alcohol. Its caloric value is 4.1. It is available commercially in two forms—"commercial glucose", a refined, but not chemically pure substance containing from 31 to 35 per cent of pure dextrose and suitable for administration by mouth, and chemically pure "technical dextrose", which is suitable for hypodermic or intravenous use. The great value of glucose as a theraeputic agent resides in the fact that it requires no digestive process to prepare it for absorption and in its metabolism it places no strain on the excretory ap-

* Read at the Sixty-fifth Annual Meeting, Canadian Medical Association, Calgary, June 20, 1934.

paratus, as it is completely metabolised to carbon dioxide and water. Further, in the bodily economy it spares protein and fat, and plays an essential part in maintaining the acid-base balance.

According to Joslin, the carbohydrate intake in the diet of the normal adult is about 400 grams and supplies about 55 per cent of the energy in the normal diet. These figures indicate how large a place sugar and starch occupy in the daily food intake.

METHODS OF ADMINISTRATION

There are four methods of introducing glucose into the body—by the mouth, hypodermoclysis, by a vein, and proctoclysis.

By the mouth.—The method of administration of glucose by the mouth, being physiological, is the mode of choice unless there are definite contraindications. A simple glucose solution, being sweet, is apt to be nauseating in many cases. We have found that this difficulty may be overcome by adding the desired amount of glucose, for example, 250 or 300 grams, to one quart of iced lemonade, and this is taken at intervals during the day. A less palatable but satisfactory preparation is provided by a solution of corn syrup or the solid commercial dextrose. In this way a large extra ration of carbohydrate is provided to the patient which is easily assimilated. This additional complement of 250 grams of glucose, together with the carbohydrate provided in the regular hospital general diet, is still well within the normal tolerance of a healthy adult. Sansum and Woodyatt,[1] in their work with dogs, found that no matter what concentration or amount of glucose was placed in the stomach of the animals, absorption took place at a uniform rate of 1.72 grams per kilo. of body weight per hour, and, further, that glucose did not appear in the urine. We have found this borne out in practice, although sugar has appeared in the urine of more persons than this study would lead one to expect. The ease and the value of the oral administration of glucose should be emphasized, particularly because the established procedure of intravenous injection of glucose has caused us to forget that more glucose may be given by the mouth, and, at the same time, under suitable circumstances far more will be assimilated. This is particularly true in those conditions where it is essential to minimize protein or fat metabolism. In fact the entire caloric requirement may be provided in this way. As we shall mention later, this oral method of administration is particularly valuable in cases of liver disease and in biliary disease with functional hepatic insufficiency.

Hypodermoclysis. — Glucose by hypodermoclysis, to provide isotonicity, must be given in a 5 per cent solution. This practice in our opinion is open to many objections. In the first place, even although the site of injection is carefully chosen, the method is in most cases painful and cannot be made really comfortable. There is, further, the danger of infection, and the additional danger that with the passive accumulation of fluid in the tissues a slough may be produced. There is some uncertainty about the absorption of the glucose, which may in addition be slow. Finally, the amount of glucose which may be introduced in an ordinary hypodermoclysis is not sufficient to warrant the discomfort which the method involves. Of course there are circumstances under which it may be necessary to resort to this mode of administration, but as a general practice it is unsatisfactory.

The intravenous method.—The use of glucose by intravenous infusion as a procedure is well established, widely used, and of great value. Formerly there was considerable discussion concerning systemic reactions which occasionally followed intravenous injections of glucose, and many factors were suggested as responsible for such phenomena. In more recent years, however, these reactions have become relatively infrequent, with the use of properly and freshly distilled water and care in the selection of the glucose and the mechanical appliances used. A great deal recently has been written concerning the phenomenon of "speed shock", to use the term applied by Hyman and Hirshfeld[2] to the reaction following too rapid introduction of substances into the veins. While observers do not agree on the absolute speed which is recommended, the value of such work has been to emphasize the importance of the slow introduction of solutions into the veins, especially when these solutions are hypertonic, and to advise a speed not to exceed 3 to 5 c.c. per minute. The practical value of this work has been to bring into wider usage the so-called "continuous intravenous drip" first advocated by Matas in 1924. This method is invaluable in a wide variety of medical and surgical conditions. It

makes it possible to introduce into the body large amounts of fluid, under circumstances in which it was previously impossible. With such infusions, glucose solutions of 5 per cent strength should be used, as they are isotonic with the blood. The rate of injection may be 30 to 50 drops per minute in the average case, and in this way from 4 to 6 litres of fluid are provided during the course of twenty-four hours. This supplies from 200 to 250 grams of glucose to the patient. This amount is well within the tolerance of the ordinary adult, Woodyatt, Sansum and Wilder[3] having determined that a normal man weighing 70 kg. can receive by vein and utilize 63 grams of glucose per hour, which in terms of a 5 per cent solution represents 1,260 c.c. per hour. It has been suggested by some writers that a combination of insulin and glucose in the non-diabetic patient has certain values, but the action of insulin is not sufficiently well understood at the present time, and there are too many dangers inherent in the practice to warrant its general use.

Proctoclysis.—The use of glucose by proctoclysis as a clinical procedure has become almost a routine part of medical and surgical practice. Like so many other therapeutic measures, rectal feeding is based upon custom which has been sanctioned by long usage, the foundations of which have received little critical examination. Practically all modern text-books on physiology, nutrition and dietetics recommend the rectal administration of glucose. When, however, one examines the experimental data on which this practice is based, one is impressed by the conflicting opinions which exist and by the incomplete nature of the studies, which in most instances can hardly be called physiological. In view of its therapeutic importance, we wish to examine this question in some detail.

HISTORICAL SUMMARY

The primary principle at issue is the ability of the colonic mucous membrane to absorb glucose. We may pass over at once the earlier literature dealing with this point, which described many mixtures useful for maintaining nutrition when given by the rectal route. In reviewing the more recent investigations the majority of observers would appear to favour the use of glucose by proctoclysis. Further critical analysis, however, of this work, as we shall point out, does not permit us to accept this conclusion.

The following investigators claim to have demonstrated absorption of glucose from the colon following rectal instillation. Deucher reported absorption of glucose up to 77 per cent of the amount introduced. Boyd and Robertson by estimating enema returns claimed considerable glucose absorption. Mutch and Ryffell, using similar methods, concluded that glucose could be absorbed by rectum up to 175 grams per day. Luthje demonstrated a rise in blood sugar and obtained an absorption up to 90 per cent. Hari and von Halasz and Carpenter reported an increase in the respiratory quotient. Tallerman, using a 33 per cent glucose solution, reported an average rise in the blood sugar level of 30 mgm. per 100 c.c. Varela and Rubino found a slight rise in the blood sugar, using a 40 per cent glucose solution. Sollmann stated that glucose is effectively absorbed from nutrient enemas. Clendening in his current text-book recommends such enemas, and states that nine-tenths of the glucose injected is absorbed. Collens and Boas[4] in a recent study claim considerable glucose absorption, and record a rise in the peripheral blood sugar in non-diabetic patients, ranging from 16 to 25 per cent.

Other authors have been unable to demonstrate any evidence of absorption. Bingel, using diabetic patients, concluded that only small amounts of glucose were absorbed, and that this amount, as measured by rectal returns, was probably due to bacterial action. Franke and Wagner, using highly concentrated glucose enemas, observed very little effect upon the peripheral blood sugar level. Levi, using the blood sugar estimation as an index of absorption, concluded that the rate of absorption was slow and that very little sugar could be introduced in this way. Mekie and Miller found no consistent change in blood-sugar value. McNealy and Willems,[5] in a very thorough experimental study, concluded that the glucose enema is of little or no nutritional value, and that any absorption of glucose administered in this way probably depends on the passage of the fluid into the ileum through an incompetent ileocæcal valve. They further reported that the addition of sodium chloride to the glucose solution slightly increased the absorption of glucose, but not enough to be of practical importance.

Scott and Zweighaft[6] were unable to demonstrate a rise in the blood sugar curve after glucose retention enemas; they questioned the value of results based upon a study of the returned enema as evidence of glucose absorption. The most thorough and comprehensive study to date has recently been carried out by Ebeling,[7] whose work appears conclusive in this regard. In experimental animals he found a marked difference in the ability of the ileum and colon to absorb glucose. The rate of absorption of glucose by the colon and rectum from solutions varying from 5 to 10 per cent was negligible. For example, the rate of absorption, using a 10 per cent solution, was such that in a 24-hour period, assuming that the same rate could be maintained, the total glucose absorbed would amount to only 27.7 grams. Hypertonic solutions, he found, were absorbed little faster than isotonic. The presence of dextrose caused retardation in the rate of water absorption. His final conclusion was that the total amount of glucose which can be administered and absorbed from the colon under the best conditions is too small to be of any therapeutic value.

EXPERIMENT

In a series of normal fasting men we have attempted to ascertain the amount of glucose absorbed from glucose enemas. Solutions of glucose in water were used, varying in strength from 5 per cent to 20 per cent, the amount of fluid injected varying from 200 to 400 c.c. The enema was administered at 9 a.m., the patients having been starved since 5 p.m. the previous evening. The blood sugar was estimated previously to the administration of the enema and at subsequent intervals of ½ hour, 1 hour and 2 hours. The estimations of the blood sugar were made by the Folin-Wu method. The accompanying Table indicates the results obtained.

From these experiments we were unable to demonstrate a rise in the blood sugar curve after the administration of glucose in retention enemas.

TABLE I

BLOOD SUGAR ESTIMATIONS AFTER THE ADMINISTRATION OF GLUCOSE SOLUTIONS OF VARYING STRENGTH BY RECTUM

Patient's No.	*Body weight, in lbs.*	*Percentage strength*	*Amount injected, in c.c.*	*Blood sugar, mgm. per 100 c.c.*			
				fasting	*½ hour*	*1 hour*	*2 hours*
1	138	5	400	95	92	95	96
2	181	5	400	95	93	95	95
3	194	5	400	86	90	88	86
4	136	5	400	80	80	86	80
5	166	7	200	94	97	90	86
6	201	7	200	100	83	87	77
7	150	10	250	87	88	84	80
8	160	10	250	80	78	76	74
9	136	10	250	105	83	85	83
10	170	10	250	100	80	83	76
11	115	15	200	76	70	74	72
12	220	15	200	87	85	80	76
13	185	20	200	83	81	80	79
14	172	20	200	90	86	87	80
15	190	20	200	90	83	83	68
16	155	20	200	83	77	70	66

COMMENTS

Certain comments on the studies which have been made on this problem seem justified. Most of the experimental evidence which has been brought forward has been too narrow in its scope, inadequate, and poorly controlled. The attempt on the part of some writers to settle the question by means of measuring the glucose recovered from the initial enema after a period of time (the so-called "washout method") can hardly be called physiological. It fails to take into account the loss of glucose by bacterial action and the fact that the solution may be carried beyond reach of recovery or may even pass through an incompetent ileocæcal valve. Further, it is highly questionable, as pointed out by Cori[8] and by Ebeling,[7] whether the peripheral blood-sugar curve can be accepted as a measure of intestinal absorption. Ebeling could find no correlation between the amount of glucose absorbed and peripheral blood sugar levels. This he maintained might be due to the slow rate of absorption or to the stimulation of some mechanism which increases the withdrawal of glucose from the blood stream. He did, however, observe a correlation between colic venous blood sugar levels and the amount of glucose absorbed. Ebeling further points out the fact that some of the results claiming glucose absorption based upon a rise in the peripheral blood sugar level or on a rise in the respiratory quotient may be explained on the basis of mobilization of liver glycogen in response to nervous stimulation and to mechanical pressure changes in the intestinal tract following the glucose enema. After a review, therefore, of the experimental studies which have been made upon this problem, we are forced to believe that the

amount of glucose which can be absorbed through the colon is too small to be of any clinical value, and that the use of glucose by proctoclysis in any concentration serves no useful purpose. Not only is it of no clinical value, but certain objections may be raised to its use in rectal solutions. It may in certain patients be irritating; in concentrations above 5 per cent its osmotic pressure is above that of the tissue fluids, and these two factors interfere with the absorption of water, which after all is the essential factor in rectal feeding. Ebeling found, for example, that the presence of glucose in the rectal solution caused a definite retardation in the rate of water absorption. There is the further possibility that the use of the rectal drip with glucose contributes to post-operative abdominal distension.

We have discussed in some detail the use of proctoclysis in its relation to glucose. Because very little glucose is absorbed from the rectum, and because the inclusion of glucose in rectal solutions may interfere with the absorption of water, it is our contention that glucose should not be given by the rectal route. The essential rôle of proctoclysis, after all, is the maintenance of water balance where it is impossible or inadvisable to administer fluids by mouth, and this function should not be impaired by the addition of glucose to the rectal fluid. In the choice of a solution for proctoclysis, our experience has been in accord with that of Trout,[9] who, using the Murphy drip technique, noted that ordinary tap water is far better absorbed from the colon than physiological saline. We find that about 25 per cent more fluid is absorbed in twenty-four hours by using tap water.

GLUCOSE IN MEDICAL CONDITIONS

Glucose as a therapeutic agent has an established place in the treatment of many medical diseases. We wish only to discuss briefly its use in certain cardiac conditions.

The importance of carbohydrate as a source of readily available energy to the heart would appear to be established. This conclusion is strengthened by recent observations reporting anginal attacks and myocardial insufficiency from the use of insulin in older subjects with arteriosclerosis or with a previously impaired myocardium. Other writers have noted profound disturbances following the use of a low carbohydrate diet alone. It would seem as if arteriosclerosis makes the cardiac musculature more sensitive to a decreased blood sugar. It would, therefore, appear evident that the maintenance of the blood sugar level and a supply of available carbohydrate are essential factors in the handling of heart disease.

Beneficial results from the intravenous administration of high concentrations of glucose have been reported in cases of paroxysmal dyspnœa, in acute toxic myocarditis, congestive heart failure, and the collapse stage of coronary thrombosis. In the treatment of cardiac failure, Smith and associates[10] have advocated the use of a high carbohydrate diet in which the carbohydrate is supplied mainly by the simple sugars. They have claimed striking results by such a diet and have suggested that the beneficial action of the carbohydrates on the liver injury produced by prolonged congestive failure contributes to the effectiveness of the diet. Other writers, notably Morawitz and Hochrein, Jagic and Klima, Kilgore, and Marvin, have called attention to the value of glucose in the treatment of cardiac failure.

Glucose, further, has a place in the collapse stage of coronary thrombosis, and later in the course of the disease when the heart is threatened with failure. Most observers prefer to use a 50 per cent solution intravenously in amounts from 20 to 50 c.c. at varying intervals of time. As Falk has pointed out, glucose under these circumstances provides a source of readily available energy to the myocardium, in its concentrated form probably helps to control pulmonary congestion so frequently found in coronary occlusion, and combats shock. It should be pointed out that this procedure, like any other measures used in coronary occlusion, must not be used in any routine fashion, but should be employed with a full recognition of the particular factors involved in the case.

We can only refer to many clinical reports calling attention to the efficacy of glucose in other cardiac conditions. Edmunds and Cooper,[11] for example, have noted marked improvement by the intravenous injection of glucose in the circulatory failure and collapse produced in experimental animals by the subcutaneous injection of diphtheria toxin. Marvin records striking results with the use of glucose in patients suffering from paroxysmal dyspnœa.

The significance of the fact that the disturbance of glycogen metabolism in hypoglycæmia may on occasion give rise to anginal pain has naturally resulted in an attempt to inhibit anginal pain by the administration of glucose. K. S. Smith[12] has recently reported encouraging results from the use of glucose with insulin in a group of selected cases suffering from angina pectoris.

We may say, therefore, that while much work, clinical and experimental, remains to be done upon this problem, controlled experience to date would appear to point to the fact that glucose has a very definite place in the treatment of cardiac conditions.

GLUCOSE IN SURGERY

The object of pre-operative care in surgical cases is to secure for the patient the best possible state to withstand the operative procedure, and to avoid post-operative complications. To achieve this end the principles employed have been physiological rest and the building up of the patient's reserves. The practical application of these principles has involved the use of those measures of pre-operative care now generally employed, particularly with respect to the water balance of the body. In addition to these measures, we feel that it is equally important to secure an optimal glucose reserve for the patient. This practice is in keeping with the principles underlying surgical care; its end may be easily secured in most cases by the administration of carbohydrate by mouth, and its benefits are to be seen in a smoother post-operative course. We urge, therefore, that as a general pre-operative measure the patient be supplied with a liberal amount of carbohydrate. In elective operations we have made it a practice to hospitalize the patient for 48 hours prior to operation (which in itself is a sound practice) and during this time to give the patient, in addition to the regular hospital diet, from 250 to 300 grams of carbohydrate daily in the form of glucose in fruit juice or lemonade.

We hardly need to emphasize the advantages the continuous intravenous administration of glucose by the drip method in acute abdominal surgery and particularly in gastric surgery. Its benefits are to be seen in the increased comfort of the patient, the freedom from vomiting, the maintenance of the water balance, and the correction of acidosis. It further protects the liver in those acute abdominal cases in which the operative procedure is prolonged or in which the liver already in a state of partial glycogen starvation has not been previously reinforced to withstand the insult of operation.

Glucose in gall bladder and liver surgery.—The value of glucose is probably seen in its most striking form in gall-bladder and liver surgery. The experimental basis for this use of glucose has been established by several observers. Opie and Alford, Graham, Davis and Whipple have demonstrated that the feeding of carbohydrate lessens the susceptibility of dogs and rats to necrosis of the liver by chloroform and phosphorus. Judd states that the hepatic structure may be reduced to 15 per cent of the normal, and yet will carry on its function normally if the animal is kept on a carbohydrate diet. Bollman has shown that the use of glucose greatly increases the detoxifying action of the liver. The work of Whipple and Hurwitz has demonstrated that the administration of glucose tends to reduce the prolonged coagulation time in jaundice.

Clinically, these experimental observations mean that glucose affords protection to the liver in all the complex functions which it has to perform. In surgical diseases of the biliary system, and particularly gall-bladder disease, there is associated liver damage and, as a result, secondary functional hepatic insufficiency. It is particularly desirable, therefore, that in such disorders the patient be given large amounts of dextrose. In this way, as Althausen[13] has pointed out, the internal carbohydrate starvation is corrected, glycogen storage is secured, and adequate functioning of the liver results.

The most practical and satisfactory way of giving glucose to patients prior to operation on the biliary tract is, as already stated, by means of the regular hospital general diet supplemented by 250 to 300 grams of glucose in a liquid medium in small amounts during the day. Oral administration of glucose has been shown to produce an increase in hepatic glycogen as efficiently as the intravenous route. We have verified this by the microscopic comparison of the glycogen content of livers under varying conditions. Sections of rabbit liver are shown to demonstrate the ability of the liver to store glycogen after oral administration of carbohydrate (Figs. 1 and 2).

A section of the liver of a patient who received no glucose before operation is shown in Fig. 3, and contrasted with this is a section of liver of a patient who received glucose by mouth after the method above described (Fig. 4).*

to patients with gall-bladder disease has yielded striking results in a smooth post-operative course. We have recently reviewed a series of cases in which glucose was used pre-operatively, and compared this group with

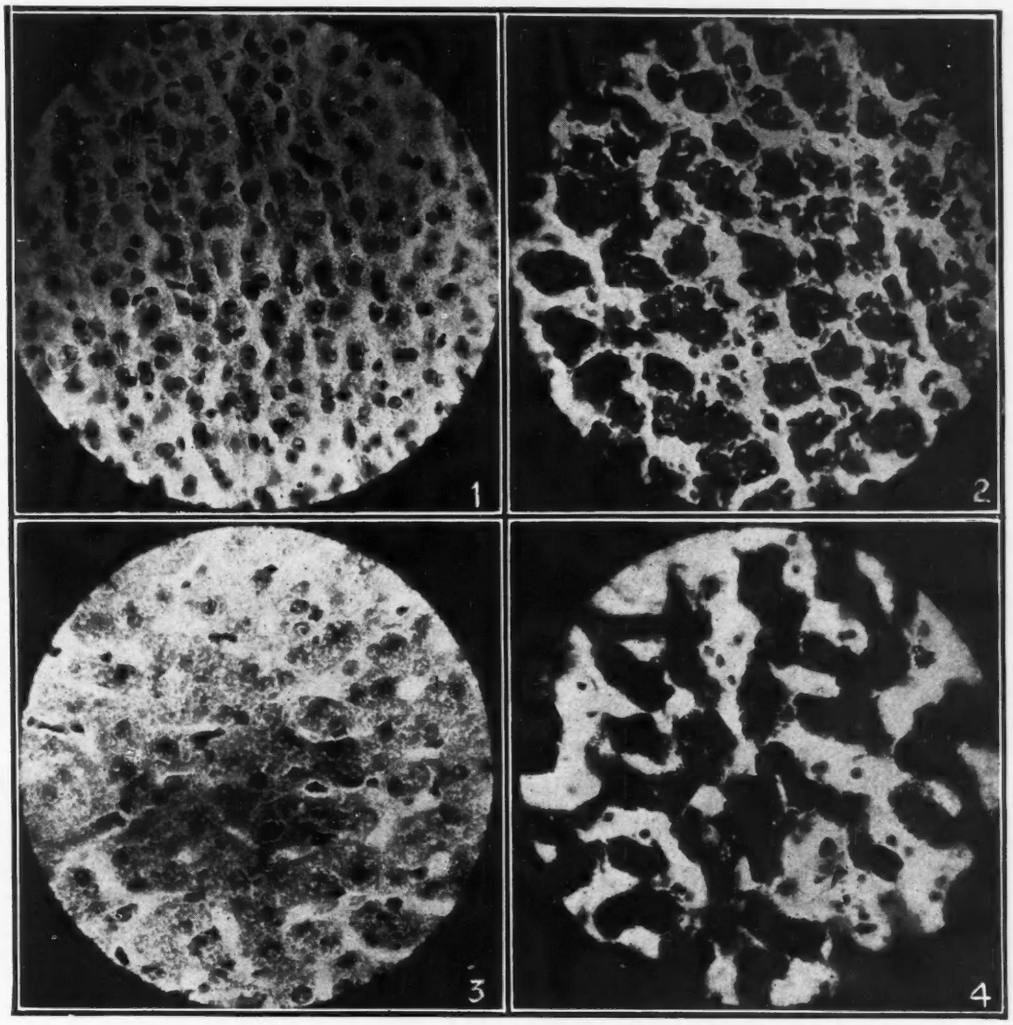

FIG. 1.—Section of liver of rabbit after relative carbohydrate starvation.
FIG. 2.—Section of liver of rabbit after 72 hours of high carbohydrate feeding.
FIG. 3.—Section of liver in patient without any pre-operative carbohydrate preparation.
FIG. 4.—Section of liver in patient receiving high carbohydrate diet for 48 hours prior to operation.

It should further be emphasized that the injured liver in man does not lose its ability to store glycogen, but will do so to a marked degree when sufficient glucose is provided. Althausen's work in this connection in experimental animals and in patients with diseases of the liver would appear to be conclusive.

It has been our experience[14] that pre-operative administration of large amounts of glucose a smaller number of cases receiving no glucose before operation. The temperature curve in the prepared group was lower on the average, and reached normal on the fourth day, as against the sixth day in the other group. The pulse rate showed a similar contrast, reaching normal on the third day as against the fifth day. Vomiting was very much less in the prepared group and distension scarcely a factor. While these features show a striking difference, the most marked benefit of the glucose preparation is to be seen in the improved post-

* The sections of liver were all stained for glycogen, using Best's carmine stain. The glycogen by this method takes a brilliant red stain, but in the micro-photographs appears as black clumps and granules within the liver cells. Iodine was used as a control stain.

operative course and the general well-being of the patient.

CONCLUSIONS

1. In operative surgery it is important to maintain at all times an optimal glucose reserve. Pre-operatively, in most cases this may be achieved by oral administration.

2. The administration of glucose is essential in surgery of the biliary tract.

3. Glucose has a definite place in the treatment of cardiac conditions.

4. Glucose is of no value when given by proctoclysis in any concentration and its presence in the rectal solution retards the rate of water absorption.

The authors gratefully acknowledge the technical assistance of Dr. John Macgregor and Dr. J. J. Ower, of the Department of Pathology, University of Alberta.

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CLIMATIC BUBO AND LYMPHOGRANULOMA INGUINALE

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CLIMATIC bubo and lymphogranuloma are clinical conditions which were never mentioned while I was an undergraduate. In 1929, at the Royal Infirmary, Edinburgh, no attention was drawn to them during an excellent course on venereal disease which I attended. The London School of Tropical Medicine, in the same year, showed cases of climatic bubo but did not point out their relation to lymphogranuloma. More recently I have been in contact with medical men from widely separated points in America and I found that they also were unfamiliar with these conditions. Nevertheless climatic bubo and lymphogranuloma are not new. They have been described for half a century and they are no more tropical than amœbic dysentery.

Climatic bubo and lymphogranuloma must be not infrequent in Canadian ports such as Vancouver and Montreal, where they will have been introduced from the Orient and the West Indies, yet Stannus[1] after reviewing the literature and quoting 927 references in his monograph states that he has not heard of a case reported from Canada.*

Definition.—This sixth venereal disease may be defined as a human contagious disease, acquired venereally, possibly commoner in warm climates, due to an ultra-microscopic virus communicable to certain experimental animals; characterized by a small, often transitory, commonly herpetiform, initial inoculatory lesion on the external genitalia, followed by the development in the regional lymphatic glands and adjacent connective tissue of a characteristic subacute or chronic inflammatory neoformative reaction, with the production in the majority of cases of multiple small foci of suppuration; associated generally with constitutional symptoms, which may include lassitude, prostration, fever, sweats, anorexia, loss of weight, rheumatic affections and skin reactions. The adenopathy in the male, and in

* Four cases of granuloma inguinale, one of them indigenous, have been reported from Montreal.[2] See *Canad. M. Ass. J.*, 1930, **23**: 637 [ED.].

some much smaller proportions in the female, is localized in the inguinal and inguino-cruro-iliac glands, giving rise to the syndrome known as "climatic bubo" or lymphogranuloma inguinale (paradenitis)—Stannus.[3]

CLIMATIC BUBO

Clinical picture.—Climatic bubo presents a perfectly characteristic clinical picture. The patient, usually a young male adult, complains of a painful swelling in the groin which he has had for a week or ten days and which has been associated with some fever and malaise. Upon examination he is found to have a single, or, it may be, bilateral bubo, which in my experience is extremely constant in size and position. The bubo is due to a periadenitis situated just above the middle-third of the inguinal ligament and is the size of a hen's egg. In the vast majority of cases the patient denies having noticed the small initial lesion and nothing is to be found on the penis.

Left to itself, the bubo gradually becomes boggy and soft at its centre. At one or more points over its surface sinuses develop from which is discharged a watery grey pus. After this has occurred the bubo subsides somewhat and the patient feels perfectly well, but the discharge continues for an indefinite period. While the bubo is soft, but before sinuses develop, should one incise or aspirate it, very little pus is secured, perhaps three or four cubic centimetres.

LYMPHOGRANULOMA INGUINALE

Clinical picture.—When one comes to consider lymphogranuloma inguinale the clinical appearance is not nearly so clear or so constant. There is, however, an important group of cases in my experience which is not associated with any special adenitis, but which is due to the same virus as that which produces climatic bubo.

Patients of this class are usually in fairly good health. They present in the groin, on the vulva, or on the penis "blubbery" indurated areas, the surfaces of which are covered with numerous sinuses discharging a sero-purulent exudate. In some cases this granulomatous area extends like a huge collar around the penis; in others it is so extreme as to justify the term elephantiasis. The condition I have described is not luetic; it is not phagedænic; nor is it due to a neglected chancroid infection.

In the typical case, the patient has had the lesions for many weeks, perhaps months; there is no satellite bubo; spirochætes cannot be demonstrated in the discharge, and the Kahn reaction is negative. This would seem to rule out syphilis fairly well, while the appearance of the lesions does not correspond with the description of either phagedæna or ulcus molle.

Phagedæna is a form of spreading ulceration rarely met with at the present time except in connection with venereal disease, and seldom apart from syphilis. It always attacks the unhealthy and debilitated, and is largely due to the retention of discharges resulting from phimosis (Rose and Carless[4]). "The typical chancroid is a round ulcer with undermined or perpendicular edge. This ulcer is usually rather deep, is surrounded by a non-indurated inflammatory areola, bleeds easily, and may be intensely painful" (Keyes[5]). The cases which I consider lymphogranuloma occur in vigorous young adults; their lesions are essentially chronic, painless ones, while the change in the tissues is more hyperplastic than ulcerative. Finally, they nearly all give strongly positive Frei intracuti reactions.

When I first encountered cases of climatic bubo and lymphogranuloma inguinale I was ignorant of the intracuti reaction of Frei, but I recognized that after one had dealt with the cases of primary syphilis, gummata, phagedæna, and ulcus molle, there was still a further group to deal with which did not fit into any of these categories. Nevertheless, I followed a well established custom and said that these cases were some manifestation of syphilis. When advanced cases of lymphogranuloma inguinale were met with I fell into a further blunder and diagnosed them as granuloma venereum, a disease due to an entirely different organism, probably not present in this area.

These mistakes were cleared up to some extent when I secured a satisfactory antigen from a case of climatic bubo. This antigen is one developed by Frei,[6] and its preparation is described as follows: "The person from whom the antigen is to be made should be proved free from tuberculosis, and free of other venereal disease past or present, by clinical examination and negative tests for syphilis, gonorrhœa and ulcus molle. The gland from which pus is to be withdrawn must be one that has undergone softening, but not fistulation. Aspiration by

means of a Record syringe and thick needle, under aseptic precautions, of, as far as possible, blood-free pus, is then carried out. The fluid is mixed with physiological saline in the proportion of one part of pus to five or six parts of saline in a sterile tube and immediately put up in 0.5 to 1 c.c. doses in Jena hard glass ampoules. So prepared, it is heated for two hours at 60° C. in a water bath, and the following day at 60° C. for one hour".

Frei's results have been confirmed by others and he maintains that *when properly prepared,* his test is absolutely reliable. Unfortunately, the same may be said of the Elixir of Life! It is very difficult to be sure that a patient is free from tuberculosis, has never had a venereal disease, and so on. In preparing my antigen I merely selected a case of climatic bubo, which appeared to be free from other infections and aspirated the pus from the softened bubo. This pus I diluted and sterilized and proceeded to try on the cases I was treating. These had all been referred from the medical clinic and all came with a genital lesion of some sort. My results, using the method of Frei, are submitted in Table I.

TABLE I

FREI INTRACUTI REACTION

Clinical diagnosis	*Positive*		*Negative*		*Total positive*	*Percentage positive*
	M.	*F.*	*M.*	*F.*		
Climatic bubo	15	2	6	2	17	68.0
Lympho-granuloma	5	6	2	2	11	73.3
Lesions of uncertain etiology	11	1	5	0	12	70.0
Totals	31	9	13	4	40	70.0

It will be seen that I have made three clinical groups; those that I considered typical climatic bubo; those I considered lymphogranuloma inguinale; and a third group showing genital lesions of uncertain etiology. The lowest percentage of positives occurred in the cases of climatic bubo, while I noticed that the degree of local reaction was less marked than in cases of lymphogranuloma inguinale, and that in a few instances a case that was negative at first later became positive. In my experience, a positive reaction produces a small dome-shaped "button" of infiltration, which, in a coloured patient, is much more readily felt than seen. A small area of necrosis at the centre I have only observed a few times, and this was in cases of lymphogranuloma inguinale.

In testing the reliability of my antigen, I used as controls, children, adolescents, cases of primary syphilis with a positive Kahn test, and cases of ulcus molle which I submitted to autoinoculation tests. I found that, in the clinical material at my disposal, adult controls had to be selected with some care. Patients might give a negative history and be free from any sign of this disease, yet give a positive Frei reaction, since climatic bubo in this area appears to be quite as common as other venereal diseases.

Thus far I have not observed this infection in children. Climatic bubo is commonly, but not exclusively, encountered in men, while lymphogranuloma inguinale is, I think, seen somewhat oftener in women, a fact which may possibly be explained by the difference in the lymphatic drainage in the sexes. The age distribution of the last 50 cases referred for treatment was as follows:

TABLE II

Ages	*Male*	*Female*	*Total*
0–14	0	0	0
15–19	6	5	11
20–24	10	9	19
25–29	10	2	12
30–34	4	1	5
35–39	2	0	2
40–44	0	0	0
45–49	1	0	1
Total	33	17	50

TREATMENT

In the treatment of this virus disease there does not seem to be much agreement. A great variety of agents has been employed, and no one, so far as I am aware, claims to have a specific cure. Surgical measures have had many advocates and some still continue to use this form of treatment. The results, however, have not been any better than many simpler and safer methods. Aspiration of a softened bubo is a harmless and beneficial procedure, but total extirpation of the glands of the groin is neither simple or safe. The wound frequently fails to heal by first intention, fistulæ

develop, and the patient may require weeks and months of attention. The literature is full of reports of post-operative complications such as erysipelas, gangrene of the scrotum, elephantiasis of the leg and other unpleasant developments. When it is remembered that the disease is rarely fatal and that in most cases of climatic bubo recovery eventually occurs, whether treated or not, I think one is justified in concluding that its treatment by surgical measures is not desirable. This is not so true in the later and less common forms of lymphogranuloma inguinale, referred to under the name of "Esthiomène". I have seen stricture of the female urethra, stricture of the vaginal introitus, rectal stricture with recto-vaginal fistula, and ruptured uterus following pregnancy in a woman with a granulomatous cervix. Such conditions must, of course, be treated surgically.

Hanschell[7] introduced non-specific protein therapy in 1926, with aspiration of the contents

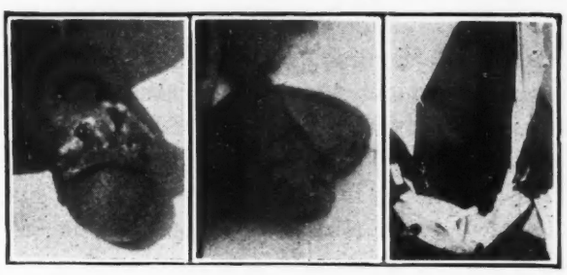

FIG. 1 FIG. 2 FIG. 3

FIG. 1.—Case of ulcus molle—auto inoculation positive, Frei intracuti reaction negative.

FIG. 2.—Moderately advanced lymphogranuloma—note the thickened collar with multiple foci of discharging sinuses.

FIG. 3.—Climatic bubo—showing the characteristic inguinal adenitis.

of the softened gland. This was the form of treatment I was taught at the London School of Tropical Medicine. In practice, I think this method has some drawbacks. The patient must be in hospital under medical observation, and this is both expensive and inconvenient where many cases have to be treated. In the second place, the production of "protein shock" is an alarming and unpleasant experience for the patient and not without worry to the attending physician. Few doctors would prescribe this treatment for themselves! A few of the drugs extensively used include tartar emetic, stibenyl, neostibosan, solganol and cuprasol. My experience relates only to the first-mentioned. We have used a 1 per cent watery solution of tartar emetic intravenously at the Bahamas General Hospital for about four years, treating in that time some 200 cases. In our hands this drug has proved exceedingly satisfactory, and we have not therefore felt it necessary to experiment with other agents.

A 1 per cent solution of tartar emetic is made up in distilled water. This is sterilized in an autoclave and is then ready for use. The initial dose (5 to 6 c.c.) is given into any convenient vein, and if this is well tolerated, the drug is given in doses of 8 to 10 c.c. three times per week. Ten such injections constitute the average course, and this is repeated if necessary.

Complications.—Tartar emetic must be given skilfully. Any bungling that injures the vein, even though the vein be ultimately entered, permits extravasation into the tissues and in such cases excruciating pain ensues. Injection of small quantities of the drug into the perivascular tissues causes thrombosis, larger quantities, abscess formation.

Salivation is produced in most patients, and some will vomit after receiving the drug. Rarely a patient is seized with a feeling of constriction in the chest and violent coughing. In the course of treatment I have observed no fatal cases. On the whole, the use of this drug, while it may be the cause of some discomfort, appears to be free from serious danger.

Whether tartar emetic is a cure for the manifestations of this infection I am unable to say. It probably is not. My aim, in cases of climatic bubo is to prevent softening and to secure a hard bubo, which will gradually, over a period of months, diminish and disappear, meanwhile permitting the patient to carry on with his job. In cases of lymphogranuloma inguinale my aim is to secure a drying-up of the discharge with the formation of scar-tissue. Cases of climatic bubo, if seen late, may go on to softening and require aspiration. I have had to do this three times in the last 50 cases. None of these patients was hospitalized. The response in cases of lymphogranuloma is even more gratifying. It is a common experience to have a patient who has had foul discharging sores for weeks volunteer the information after the second or third injection that he is much improved. He reports the discharge as growing less and the surfaces of his sores as looking cleaner. Indeed, I have come to question the diagnosis in any case which does

not show marked improvement after the fifth or sixth injection. Frequently these turn out to be "missed cases" of syphilis.

CONCLUSIONS

1. Climatic bubo and lymphogranuloma inguinale are forms of a widespread but little known disease due to a filterable virus.

2. My experience with the Frei intracuti reaction is reported.

3. The administration of tartar emetic, intravenously, is a simple, safe and cheap form of treatment, which avoids hospitalization and reduces the cases requiring surgical care to a minimum.

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EFFECTS OF CYCLOPROPANE ON THE NORMAL AND IMPAIRED LIVER*

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FOLLOWING their discovery of the anæsthetic properties of cyclopropane,[1] Henderson and Lucas studied its effects on the metabolism of cats and rabbits.[2, 3] They found no great change in either pH or CO_2 combining power, and little change in the blood sugar. Stiles, Neff, Rovenstine and Waters[4] report the clinical use of cyclopropane in 447 cases, with satisfactory results. They state that the blood pressure, pulse and respiratory rates are not altered to any appreciable extent, and that the after-effects are very slight. Cyclopropane has been used by one of us in 34 obstetrical cases,[5] among which the bromsulphalein dye test[6] for liver function was carried out in three normal persons and one other suffering from eclampsia. Practically no dye was retained in the bloods of the normal women when the test was applied about twenty-four hours after the administration of cyclopropane, and, as the liver of the eclamptic woman was damaged to an extent of more than 55 per cent before delivery, the damage was not enhanced by cyclopropane, there being less than 50 per cent of the dye retained in her blood twenty-two hours after anæsthesia.

It has seemed worth while to study more fully the effects of cyclopropane on the liver. Accordingly normal dogs, dogs suffering from chloroform poisoning, and starved dogs have been anæsthetized with cyclopropane and examined for liver damage.[6] In each instance cyclopropane anæsthesia was induced through a face mask and maintained intratracheally with a Guedel inflator tube attached to a Foregger gas anæsthetic apparatus, the kind that is fitted with an attachment for the absorption of carbon dioxide from the expired air.

Dog No. 1.—A normal dog, was anæsthetized daily with cyclopropane for one hour successively for nine days. Twenty-four hours after the first and third administrations there was 10 per cent dye retention, but none twenty-four hours after each of the other seven administrations. On the tenth day the liver was removed and sent to the Pathological Institute of the Royal Victoria Hospital. The following is a copy of Professor T. R. Waugh's report.

"*Liver and gall bladder.*—A dog's liver with gall-bladder attached. It presents, grossly, a normal appearance.

"*Microscopic examination.*—Sections of the gall-bladder and liver show essentially normal structure. The only noteworthy histological changes are circulatory in character. They consist of a moderate dilatation of the intercolumnar capillaries and œdema of the parenchyma. This expresses itself as an hydropsical swelling of the hepatic cells, most noticeable about the central veins. There is no cellular exudate. There are no fatty degenerative changes."

* The cyclopropane was obtained through the generosity of Professor H. E. Reilley, of the Department of Physics, McGill University.

Repeated daily administrations of cyclopropane to this normal dog did not cause liver damage.

Dog No. 2.—A normal dog, to begin with, was given cyclopropane for one hour daily for two days; on the third day the anæsthesia was kept up for three hours, and on the fourth day no dye retention was found. On this same day chloroform was administered for one-half hour. Consecutive days after the administration of chloroform, the percentages of dye retained in the blood were 80, 90, 50 and 10, respectively. On the fourth day of this liver impairment, cyclopropane was again administered for one hour, twenty-four hours after which application of the dye test revealed a 10 per cent retention.

Repeated administrations of cyclopropane for three days, the third being for three hours, did not interfere with the liver function of this dog, nor was the damage done by chloroform enhanced by one hour of cyclopropane anæsthesia.

Dog No. 3 was anæsthetized with chloroform for half an hour. Twenty-four hours later, dye, injected intravenously, was retained to the extent of 70 per cent. Forty-eight hours later dye retention was 40 per cent. Cyclopropane was then given for one hour. The following day, dye retention was 30 per cent, and on the next day no dye was retained. In this case, too, one hour of cyclopropane anæsthesia did not impede the recovery of liver function from chloroform poisoning.

Dog No. 4.—Three successive days after the administration of chloroform the percentages of dye retention were, 60, 50 and 50, respectively. On the third day after chloroform, cyclopropane was given for three hours. Three consecutive days after this, the percentages of retention were 35, 10 and less than 5, respectively. And now, cyclopropane was again administered for three hours, when, eighteen hours later, dye retention was found to be less than 5 per cent.

Repeated periods of cyclopropane anæsthesia of much longer duration than is common, when produced during recovery from chloroform poisoning, do not enhance liver damage, nor prolong the time of return to normal.

Dog No. 5 was starved for three days, being allowed water only. It is believed that the glycogen reserve of the liver is lowered in this manner. Anæsthesia with cyclopropane was maintained for seventy minutes. Twenty-three hours later, application of the liver function test showed a 5 per cent retention of dye in the blood.

Dog No. 6 was starved for four days, but allowed water throughout. Its weight before starvation was 10.8 kg. and after, 9.9 kg. At the end of the fourth day cyclopropane was administered for three hours, and twenty-two hours later no dye was found in the blood fifteen minutes after its intravenous injection.

From all of the above data we feel justified in concluding that cyclopropane anæsthesia does not damage the normal liver, even after repeated administrations, nor after long periods; that it does not enhance the liver damage purposely produced by chloroform, nor impede the usual recovery of the liver from chloroform poisoning, even when the cyclopropane anæsthesia is prolonged; and that it does not cause liver impairment in starved dogs even after a three hour period of anæsthesia.

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ABORTION IN HUMAN INFECTION BY B. ABORTUS (BANG).—F. Witenstein describes a case of spontaneous abortion in the fourth month in a female cook who had had a three weeks' illness diagnosed first as influenza, then as typhoid fever, and finally (serologically) as Bang's disease. Abortion in the human (unlike the bovine) infected subject is very uncommon, and may be held to be an unspecific reaction, such as might occur in any febrile disorder. That explanation seems to be contraindicated, in the present case, by the facts that expulsion of the placenta had been preceded by a specific vaccination, and that its removal by curetting was followed by a negative serological test. In the cow Bang's disease is followed by sterility; but Witenstein's patient later became pregnant twice. Allusion is made to Schürer's case, in which a gynæcologist became infected with Bang's bacillus during a curetting.—*Zentralbl. f. Gynäk.*, July 7, 1934, p. 1583, Abs. in *Brit. M. J.*

IS TOTAL THYROIDECTOMY RATIONAL AS A METHOD OF TREATMENT?

(A CRITICAL SURVEY)

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True science invites criticism. Science that cannot meet criticism does not survive.

DURING the last eighteen months the attention of physicians has been called to total ablation of the thyroid for combating congestive heart failure and angina pectoris. The credit for this suggestion belongs to Drs. Blumgart and Levine. The latter[1] made an observation that in a case of masked hyperthyroidism in which a subtotal thyroidectomy was performed and beneficial results obtained microscopic examination showed a picture of normal thyroid tissue. "This clinical observation was suggestive that the extirpation of the normal thyroid gland might be helpful in cardiac failure not due to thyrotoxicosis". Dr. Blumgart gave the theoretical foundation for the explanation of the beneficial influence which total thyroidectomies must have on congestive heart failure and angina pectoris. Through a total thyroidectomy the metabolic rate becomes permanently low. The heart that cannot meet the demands of normal metabolism can become efficient in meeting lesser demands. In angina pectoris[2] "with arteriosclerotic narrowing of the coronary vessels the blood supply of the heart through these vessels may be inadequate to the needs of a normal metabolic rate although sufficient for the needs of the heart at lower metabolic rates".

In order to have a correct perspective it may be of interest to the reader to know the results of the total thyroidectomies performed more than half a century ago by the famous surgeon Theodore Kocher, of Bern. Though his work is called by Dr. Blumgart "classic", still in the article written by Drs. Blumgart, Levine and Berlin, Kocher's name has not even been mentioned, and only a few lines have been devoted to him in the subsequent paper written by Blumgart, Riseman, Davis and Berlin.[3] Here they are. "With the advent of operative treatment made possible by the work of Billroth and the classic contributions of Kocher, the effect of thyroidectomy on congestive failure was again clearly stated. In the extensive report of Kocher's cases by his son in 1902, the disappearance of congestive failure following thyroidectomy is described." From this quotation it is obvious that Kocher's observations are of the utmost interest to everyone who wants to deal with thyroidectomies.

Kocher[4] at the time of publication of his article had performed *34 total thyroidectomies* on *diseased* thyroids.* Three patients died owing to the operation, 2 died later of an unknown affection, and 1 died of a cancer of the thyroid. Of the remaining 28 cases 4 could not be reached, 18 were followed up by Kocher personally, and 6 sent in their reports by mail. The time of observation ranges from three and a half months to *nine years and two months* after the operations. In all cases the local symptoms due to pressure of the enlarged thyroid were eliminated. As for the general condition, the results were as follows. Of the 6 patients who sent the reports by mail 4 informed him that they were feeling well; 2 sent unfavourable reports. Of the 18 patients examined by Kocher himself 16 presented a picture of cachexia strumipriva of different degree, and in 2 cases the general condition was either unchanged or improved compared with that before the operation. In the last two cases Kocher found *a regeneration of thyroid tissue* in the form of hard elastic tumours, the size of an almond and a pigeon's egg respectively. Kocher considered the cases reported by mail of less importance for evaluation of the results. His observation that in the two favourable cases there was a regeneration of the thyroid tissue makes one think that such regeneration might have taken place also in the cases reported by mail.

Of interest are the two unfavourable reports sent in by mail. Kocher's case No. 44, a female, aet. 36; struma follicularis colloides. Difficulty of swallowing. Operation, March 25, 1881;

* NOTE: The italics throughout this article are the author's.

report February 19, 1883; elapsed time about 23 months. The patient's husband wrote: "Your operation has been successful, the condition of the throat has improved. However, in other respects my wife has not enjoyed an hour of health since the operation. Her body is always swollen, the limbs insensitive; she feels chilly, complains always of freezing; menstruation is irregular." The second report concerns Kocher's case No. 25, a female, aet. 38; struma colloides. Microscopic examination —suspicion of cancer. Operation, July 5, 1879; report, March, 1883; elapsed time about 44 months. The throat all right, in other respects as paralyzed.

Kocher's conclusions were:—

1. The more time that has elapsed after the operation, the more pronounced have been the disturbances.
2. The disturbances are clearly progressive.
3. All the younger patients operated on *more than two years previously* showed the bad effects to a high degree.
4. All the younger patients operated on before the age of 20, during the period of growth, with the exception of one case in which regeneration of the thyroid took place, showed the typical picture of cachexia strumipriva.
5. Only two of the older patients showed a marked cachexia strumipriva (a girl of 23 and a man of 45). The other four (ages 26, 26, 28 and 29) had it in a moderate degree. The two unfavourable reports mailed to Kocher concerned women of 36 and 38.

The picture presented by Kocher in details resembles myxœdema and cretinism. After a complete description of the symptoms Kocher wrote:[5]

"Striking is the contrast between the complaints of *fatigue, weakness and inability to work* with the well developed muscles, as was observed in the most pronounced cases. The muscles appear sometimes strong even in persons who do not work at all, so that one is inclined to think of pseudo-hypertrophy . . . If we wish to give a name to the observed picture, it is impossible not to notice its relation to cretinism and idiotism: the checked growth, the large head, the thick nose, the thick lips, the plump body, the retardation of thought and speech, with well developed muscles, point clearly to such a relationship."

Kocher named the condition "cachexia strumipriva".

It is of interest to point out three observations made by Kocher.

Soon after leaving the hospital, sometimes after four or five months, the patient begins to complain of fatigue, particularly of weakness and of a heavy feeling in the limbs, in many cases pain, a drawing sensation in the arms and legs, chilliness, a sensation of freezing in the extremities. In the winter the hands and feet become swollen.

In regard to the heart and anæmia he stated:[6] "In the pronounced cases anæmia reaches high degree. The skin and the mucous membranes, sometimes on the ears and lips, are pale; *the pulse extraordinarily small, even filiform, easily compressible. The heart sounds are usually clear, weak; the second aortic and still more the second pulmonary sounds are accentuated.*" In another place he mentions that besides the anæmic blowing murmurs frequently a strong accentuation of the second pulmonary sound occurs; the other heart sounds are often very weak sometimes at the apex.[7] The trachea becomes thin and soft. The later after the operation, the more pronounced were the changes. One may speak of an atrophy. Particularly is it pronounced in children. It is not seen in cases of subtotal thyroidectomy. It increases with the passing of time. It may be caused by poor nutrition due to ligation of all four thyroid arteries. Kocher thought that atrophy of the trachea may be the cause of anæmia and other bodily changes, as the amount of inspired oxygen and expired carbon dioxide must become diminished progressively. In a girl of 17, after a total thyroidectomy performed nine years before, the size of the trachea was that of a little child.[8]

Dr. Blumgart thinks that only a complete removal of the thyroid causes a permanent lowering of the basal metabolism and thus relieves the heart of excessive work; a subtotal thyroidectomy is not sufficient. Therefore, he advises a total ablation of a *healthy* thyroid for relief of congestive heart failure and angina pectoris. So far as I know, it is for the first time that physicians are advised to remove a healthy organ of great physiological importance for the treatment of human ailments. With this preconceived idea Drs. Blumgart and Levine began their investigations on human beings. The following quotation from a book by a physician-psychoanalyst is, in my opinion, of interest:[9] "No matter how conscientious an investigator may be, he never can quite free himself from seeing that which he wishes to see more clearly than that which he does not wish to see. This is one reason for the gross mistakes made by science which have won admittance to the general consciousness." The objectivity and exactness in the description of cachexia strumipriva by Kocher is beyond any doubt, because he had no preconceived ideas of any kind when he operated on diseased thyroids. His task was

to remove *the cause* of the trouble, which was due either to pressure or to dysfunction of the thyroid. When Kocher performed total thyroidectomies he had no predecessors to warn him. At present, the picture depicted by him should make the investigator particularly cautious. The latter must keep in his mind that he does not remove the cause of the diseases, but in the desire to relieve the diseased heart of a load, he produces artificially a new serious disease of metabolism which may cripple the patient. The bad results may not be conspicuous at once. Kocher mentions that in some cases the patients begin to complain only four, five, six months after the operation. The metabolism regulates all vegetative, animal and psychic functions of the human being, also the production of heat, which is so essential for one's activities, and it is only reasonable to assume that a *permanently* low metabolism must have a deleterious effect on the human being as a whole. There have been numerous cases of removal of healthy tonsils, appendices and gall-bladders which have been mistaken for diseased ones. However, the importance of the physiological function must count. No one would remove the heart, even if it was badly diseased.

The physiological function of the thyroid is far from being elucidated completely. Dr. Means[10] thinks that "thyroxin exerts fundamental action upon the nervous system, upon peristalsis, is necessary for normal energy exchange, salt metabolism and water, electrolyte and colloid distribution, for growth as well." Uhlenhuth believes that the action of thyrosin hormone is more than quantitative acceleration of the oxidation process; it must exert a more complicated influence. According to Means, elimination of the thyroid in the period of growth causes retardation of development, especially in the bony skeleton and brain, *which cannot be offset entirely by subsequent adequate supply or even excess of the hormone.* Little is known about the colloid. Little is known about the interrelation between the glands of internal secretion. Elimination of the thyroid must change the functions of all these glands. Rogovitch showed that hypertrophy of the pituitary follows extirpation of the thyroid in animals. It is well known that the thyroid has relation to the sex glands.[11] Kocher mentioned that Credé after removal of the spleen found a temporary enlargement of the thyroid which receded when the blood picture became normal; however, Kocher could find no enlargement of the spleen after removal of the thyroid. The adrenals might have some relation to the thyroid. It is reasonable to assume that elimination of the thyroid would affect all functions dependent on the glands of internal secretion.

In the description of his cases Dr. Blumgart[12] says: "Within from four to six weeks the skin has become somewhat paler, has acquired a slightly yellowish tint, and has become somewhat dry. After the metabolic rate decreased to minus 30 some patients complained of coldness of the feet and required more blankets. Several patients who formerly shaved once daily required a shave only every several days; the patient in the case 11 (case 3 of the previous communication) now shaves but once a week." This picture shows plainly that deep changes including changes in the secondary sexual characteristics occur shortly after the operation.

Dr. Blumgart's theory, that by lowering the metabolic rate through total thyroidectomy the inefficient heart may become efficient in meeting lesser demands, hardly can stand criticism for the following reasons.

(1) The function of the thyroid is not limited to acceleration of the metabolism. Even if it were so, its elimination must have an injurious effect on the human body. (2) Kocher's investigations prove that comfortable, useful, active life cannot be maintained at a permanently low metabolic rate. (3) It can be easily understood that as soon as the metabolic rate becomes low the inefficient heart can become efficient to meet lesser demands. But this effect cannot last long. The low metabolism must affect, through slow oxidation, the nutrition and the function of all body-cells. The function of the heart muscle must suffer progressively with the passing of time. Therefore, if the demands are less, the activity of the heart must become also less, which means that the theory based on lowering the demands and keeping the function of the heart at its previous level is untenable.

Dr. Levine, who in his paper written together with Dr. Blumgart seemed to have been in agreement with the latter's theory, at the March meeting at Peter Bent Brigham Hospital stated that the fall in metabolism is accompanied by a fall in the heart activity. Denying Dr. Blumgart's explanation, Dr. Levine has not presented any other theory instead. The experiments with injections of adrenalin are only in their infancy and do not add much to the explanation of the

beneficial results ascribed by Dr. Levine to the operation. As I pointed out, an improvement may occur only in the beginning for some time, because there is no magic in physiology and pathology. According to Kocher, an efficient heart becomes gradually inefficient after a total thyroidectomy, while, according to Blumgart, an inefficient heart becomes efficient. What is the cause for such contradictory statements? The cause must lie in the fact that Kocher stated the end-results after a prolonged observation, while Blumgart draws conclusions after a short lapse of time.

The only serious consideration is to be given to the fact that Kocher did not have at his disposal the thyroid hormone and could not influence the course of events. The present day physician is better equipped to combat myxœdema. However, it is a different proposition to treat myxœdema, as such, and to treat myxœdema artificially produced in heart failure and angina pectoris. In the cases of the first group the physician's task is to raise the low metabolic rate to its normal level, the thyroid hormone can be given lavishly, while in the second group it is necessary to keep the metabolic rate below normal, *if one does not want to make the operation purposeless.* Logically speaking, the process described by Kocher can only *be retarded but not prevented by supplying an inadequate quantity* of the thyroid hormone in order to keep the metabolism low. Even this assumption can be proved only by observations protracted for a comparatively long time. No definite conclusions can be made at present.

Dr. Means, who is considered an authority on diseases of the thyroid, and is in favour of the operation, replying to my letter, wrote: ". . . . These patients should not be allowed to show myxœdema". If this assertion is correct, and cachexia strumipriva can be avoided, then the most serious objection to total thyroidectomy is removed, and, though it is difficult to believe that low metabolism is a boon to the patients, still in some carefully selected cases the game is perhaps worth the candle. Dr. Means' line of reasoning is this. Cachexia strumipriva (which he identifies with myxœdema) develops after the metabolic rate becomes about minus 40. The physician should not wait until myxœdema develops. He should use thyroid medication and not allow the metabolic rate to fall below minus 20. Thus the cardiac would get the benefits of a low metabolism and be spared myxœdema. However, what is known on this subject does not lead one to optimism. The attention of the reader should be called to the following facts.

1. There is no strict parallelism between the appearance of the myxœdematous state and the rate of metabolism. There are cases with plus metabolism in which the myxœdematous state is present. Dr. Levine has said:[13] "*Myxœdema has been the inevitable consequence of total thyroidectomy in all instances that were adequately followed* . . . In some cases, determinations of the basal metabolic rates were *not reliable indexes* of the degree of myxœdema . . . . An example of such a discrepancy is a patient with angina pectoris without congestive heart failure whose basal metabolic rate was plus 1 per cent, but in whom the evidences of myxœdema were unmistakable."

2. Whether it will be possible to prevent cachexia strumipriva or to do away with its untoward consequences only time can answer. Spontaneous myxœdema and cachexia strumipriva may be similar conditions and still not identical.

According to Kocher, the symptoms observed in cachexia strumipriva can be due to two factors: (1) to lack of the thyroid secretion, and (2) to atrophy of the trachea, probably resulting from poor nutrition after ligation of all four thyroid arteries. The latter factor is absent in spontaneous myxœdema. Thyroid medication supplying the missing thyroid hormone does not change the situation in regard to the atrophy of the trachea. Such atrophy itself, in Kocher's opinion, may be the cause of anæmia and other bodily changes in cachexia strumipriva, taking into consideration that the amount of inspired oxygen and expired carbon dioxide must become diminished progressively.

According to Dr. Means,[14] only one case of cachexia strumipriva was observed in the Massachusetts General Hospital before Drs. Blumgart and Levine's investigations. The thyroid medication of cachexia strumipriva is only of 18 months' duration, and this length of time cannot be considered sufficient for definite conclusions. Dr. Levine asserts that cachexia strumipriva can be controlled by small doses of thyroid extract. On the other hand, Dr. Hurxthal, of the Lahey Clinic, seems to be not so optimistic. Here is a quotation from his paper referring to total thyroidectomy:[15] "This method of treatment is still in the experimental stage. Great care should be used in the selec-

tion of cases, and careful consideration should be given as to the *advisability of producing myxœdema.* In my experience with myxœdema there is nothing more tragic than to see a patient with myxœdema who cannot be brought to a comfortable existence from the thyroid point of view without producing angina. If he takes enough thyroid to feel at all well, he suffers from angina, if he reduces the thyroid so as not to produce angina, he complains of myxœdema. It is true that a certain number of people with myxœdema do not seem to mind it, but that is because they are myxœdematous and not normal individuals. Furthermore it must not be forgotten that congestive heart failure itself may result from myxœdema. . . .''

3. Severe psychoses and other untoward symptoms as yet have not been avoided *despite thyroid medication.*

4. A number of patients who experienced early relief of pain in angina have returned with frequent attacks of pain. Patients with congestive failure are returning in complete decompensation. Evidently, low metabolism is not a panacea against these conditions. Without incontrovertible proof that cachexia strumipriva can be avoided, and that a permanently low metabolism is not injurious, there can be no justification for total ablation of the thyroid.

Some of the advocates of total thyroidectomy in conversation assert that the patients selected are incurable, bed-ridden, and near their death anyway; it is worth while to make an attempt at alleviating their condition. There is no scientific way for exact measurement of the energy retained by the diseased heart. People with heart diseases not infrequently temporarily recover from a condition which seemed to the physicians hopeless. Every experienced physician has seen such cases. A heart that has stood the shock of a major operation, such as a thyroidectomy, must have contained some energy, and there is no certainty that the patient would not temporarily recover without the operation. Drs. Blumgart, Levine and Berlin in their paper stated:[16] ''These patients were chosen because the underlying cardio-vascular condition was slowly progressive or relatively stationary; they showed no evidence of syphilitic heart disease; they were not too far advanced in years; and they showed no evidence of active infection. The patients were *not gravely ill* and the operative risk appeared to be fair.''

In regard to angina pectoris I shall quote from Cecil's Text-Book.[17]

> ''Many patients with transitory or curable lesions recover entirely. There is not, unfortunately, *any absolutely certain means* of distinguishing clinically between the most serious types and those with a favourable prognosis. Some patients die during the initial attack, while others live for years—the difference depending in part on their *manner of life*, but, of course, primarily on the nature and causative factors. Recovery is undoubtedly *complete in a good many cases* . . . Each case is a problem in itself.''

The advocates of total thyroidectomy mention contraindications for the operation, recommend selection of cases, evidently to avoid an increase in the death rate. Therefore, in reality one cannot speak of the patients as moribund, and mistakes in prognosis cannot be excluded.

It follows from Kocher's paper that a patient with a *healthy* heart undergoing a total thyroidectomy for an enlarged thyroid is apt to die in over 15 per cent of all cases. If he survives and is not treated with thyroid extract, he has a chance to develop cachexia strumipriva in 75 per cent of these cases, and his *heart gradually will become deficient* after the operation. In 25 per cent there may be favourable results. However, a regeneration of the thyroid has been observed twice, and cannot be excluded in the other cases.

The death rate in Peter Bent Brigham Hospital was, according to Dr. Cutler, as follows (up to April, 1934). In 14 cases of congestive heart failure one died at 5.7 months; one at 6.7 months; one within 24 hours; one at 2 months, and another at 1 month after the operation. In other words, the mortality within three months after the operation was over 21 per cent (3 deaths to 14 cases); within seven months the death rate was over 35 per cent (5 deaths to 14 cases). In 26 cases of angina pectoris the fatalities were 8.7 months; 18 days; 6 days; 48 hours; 48 hours. In other words, the mortality within three months was over 15 per cent and within nine months, over 19 per cent (4 deaths to 26 cases and 5 deaths to 26 cases). The average death rate within nine months was 25 per cent (10 deaths to 40 cases). As I am informed, in the Massachusetts General Hospital the mortality is considerably higher. This increase in the death rate in comparison with Kocher's statistics could be anticipated despite the technical progress made in fifty years. More favourable figures are those of Beth Israel Hospital. In a personal talk with Dr. Blumgart I have found out that up to April 3, 1934,

76 operations have been performed, out of which 66 were in cardio-vascular cases (46 in heart failure and 20 in angina pectoris). The death rate within three months in 46 decompensation cases was over 15 per cent (7 deaths to 46 cases), and none in angina pectoris. The average mortality within three months was over 10 per cent (7 deaths to 66 cases).* These more favourable results can be explained as due to some special surgical technique or, what is more probable, to a more careful selection of cases, or to both. Even in these cases the average 10 per cent death rate is not too small.

The evaluation of the results depends upon the way the observer approaches the subject. It is a highly subjective matter. In Beth Israel Hospital I saw and spoke to Mr. F., the first patient who underwent a total thyroidectomy on December 15, 1932. This man works now in the Beth Israel Hospital and is considered one of the successful cases. The patient is seemingly pleased, is in favour of the operation. Previously to the operation he was decompensated and incapacitated. His metabolic rate is minus 26; he does not receive thyroid. The time elapsed from the operation is one year and four months. Before July, 1930, he never complained of heart trouble, and collapsed while at work. He was a cook. To my questions he answered that he has noticed a change in his voice and retardation of speech since the operation; he cannot move fast; he could not continue the work of tray-serving; he cannot lift heavy things, he is uncomfortable if he does so; he is cold and wears warm underwear; he would be unable to continue his work as a cook; his mental capacity is not impaired. Dr. Blumgart compares his condition with that before the operation, and is satisfied. When I looked at the patient I thought that this man of 53 years in reality after the operation was still an invalid, witness the yellow face, absence of hair on the face (he shaves once a week), the peculiar apathetic expression of the face, the pale cyanotic lips, skipping pulse, slow movements, easy fatigue, chilliness, retardation of speech. This man if he is discharged from the hospital would have a hard time to find a job, even under normal economic conditions. He does not get thyroid, because his metabolic rate is minus 26; other patients who are treated with thyroid are being kept at the same metabolic rate (approximately). He has been longer observed than any other patient and can be to some extent a gauge as to how things will develop in the *better* cases after middle age. In cases of young people, particularly in the time of growth, the results must be much worse. One has to take into consideration that the time elapsed after the operation is not long, and in other cases it is still shorter.

After leaving the hospital the patients must observe a strict régime; most use digitalis. The return to the hospital of some of the patients was due to overexertion and neglect to obey orders. But these people mostly are poor people. They cannot live under the prescribed régime. They have to work and work hard. If they had been able not to work hard and to observe a régime of rest and medication before the attacks have occurred they might have been spared the attacks. The trouble is that the diseased heart cannot stand overexertion and worries, which to a great extent are to blame for the attacks of decompensation and pain. Not much is gained in this respect by the operation.

The patients shown at the March meeting at Peter Bent Brigham Hospital, comprised a coloured man, a white man, and an elderly woman. The coloured man has returned to the hospital three times on account of decompensation. The white man seemed cheerful and looked for a job. He ought to be glad that because of the unemployment situation there is a small chance to get a job, so that he may rest and continue to be in good spirits. The elderly woman, who underwent the operation for angina half a year ago, has been free of pain, but on exertion, trying to lift a heavy load of coal, she got an attack of anginal pain. It should not be forgotten that, according to Kocher, the better condition of the patient may sometimes be due to the regeneration of thyroid tissue in an accessory thyroid, or in the left-over tissue.

Taking into consideration the short time of observation, the necessity for the patients to observe a strict régime after the operations, the comparatively high mortality rate, the selection of cases which are not "gravely ill", the absence of a scientific foundation, I believe that these

* In a letter to me, of April 4, 1934, Dr. Blumgart wrote: "The figures I gave you yesterday are not necessarily accurate for I have not had an opportunity to make a critical analysis of all our results. I wish it understood that in case you use any figures it is without my responsibility or authority".

operations should be discontinued for at least two years. Meanwhile the patients deprived already of their thyroids should be kept under observation. An important scientific research ought to be carried on in the quiet of the laboratory and in the hospital for a considerable length of time, necessary for presentation of definite conclusions to the medical profession, no matter how long it will take. In this investigation, as in many other cases, before any definite conclusions could be made the public has been led prematurely to believe that new cures have been found. The harm that will be brought about by the spread of these operations will greatly outweigh the possible temporary benefits. If total thyroidectomies will spread, the death rate which is considerable now in the best Boston hospitals will increase tremendously.

The theory of focal infection is an excellent lesson. Rosenow has given a scientific foundation which as yet is so shaky that the whole structure threatens to fall down. Recently Dr. Holbrook Lowell,[18] an enthusiastic supporter of the theory, finished his article with Dr. Verhoeff's words: "Belief in focal infection must be taken, like religion, on faith". This shows that the advocates of the theory have no scientific ground to stand on. Billings, the promoter of the theory, was very cautious, and warned against unnecessary operations.[19] However, Billings' followers have brought about a condition which has recently made a Manchester newspaper remark[20] that Manchester is going to become soon a tonsilless city. With the present day inclination to catch up with and even to overtake the teachers it may not be long before thyroidless cities replace the tonsilless ones. Already total thyroidectomies are employed in other than cardio-vascular diseases. In a recent paper from the Mayo Clinic,[21] which related a case of diabetes mellitus in a man of 26 treated by a total thyroidectomy to relieve diabetes, the authors do not encourage the repetition of these operations for diabetes. The patient "complains that sensitiveness to cold and lack of endurance are so disturbing that the advantage of improved tolerance is not appreciated".

Dr. Blumgart[22] at present does not promise prolongation of life. He cannot promise even a permanent relief because the time of observation is too short. After the operations the patients retain the same heart diseases and acquire a disturbed metabolism, not to speak of endocrine disturbances, so that they actually remain invalids. Work is motion; heat turns into motion; lack of necessary heat means limited motion, means inability to perform usual work.

In a short time more than 100 operations have already been performed in only two hospitals. Would it not be wiser to follow up the patients deprived of their thyroids before continuing these experimentations? Mankind has existed without total thyroidectomies so long that it will have patience to wait a couple of years longer. There is no need for hurry. In medicine it happens quite often that the profession becomes very enthusiastic over new methods of treatment, success follows success, and nevertheless it does not take long before the new methods are discarded altogether. The thought that in some cases the operation could possibly, not necessarily, prolong the life of a patient who died of angina pectoris or congestive failure can easily be relieved by the thought that many patients who died after the operation might have lived otherwise. As has already been mentioned, the harm brought about by the spread of the operation will greatly outweigh the possible temporary benefits. For the sake of truth and the welfare of the people, it is to be hoped that this critical survey will be accepted in the same spirit in which it has been written—*sine ira et odio.*

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AN ANALYSIS OF TWENTY-SIX CASES OF ACRODYNIA, WITH SPECIAL REFERENCE TO THEIR ETIOLOGY AND INCIPIENCY*

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A DUAL purpose has prompted the presentation of this article. Firstly, further evidence has been accumulated and is here set forth to support the argument that focal infection is etiological in this affliction, and that sound treatment should be based on an effort to eradicate such. I am well aware that many physicians on this continent have been treating this disease surgically, that is, by the removal of tonsils and adenoids and drainage of infected sinuses. Nevertheless, there appear to be many who adhere to expectant methods, with, undoubtedly, their concomitant of prolonged months of suffering. To a lesser extent in Europe than on this continent has surgical interference in this condition been practised. Ian Jeffreys Wood, in a translation of "Pink Disease", by Rocaz,[1] writes, "Some American authorities, following the teaching of Rodda, consider that a primary focus of infection exists in the naso-pharynx. They also point out that 'pink disease' does not appear in children who have previously had their tonsils removed. Thus they advocate tonsillectomy and adenectomy if the local conditions suggest any pathological changes here, and they consider that the results of the operation are encouraging". Rocaz further states, "Our present knowledge of the subject does not justify such an undertaking. Except in a surgical emergency all surgical procedures should be strictly avoided during the course of pink disease". As this work of Rocaz includes over one hundred European references, it may be accepted that it represents European opinion. In the first place, therefore, because of such a radical difference of opinion in the attitude towards this disease, evidence has been deduced from an analysis of 26 cases of acrodynia encountered by myself in the last eight years of pædiatric practice, to support the contention that upper respiratory infection is causative, and that removal of such is curative. In the second place, incentive has been furnished by the conviction that this disease may be "spotted" in many instances in its incipiency, that is, before advanced signs appear, particularly the characteristic "beefy feet and hands". As evidence thereof 5 incipient cases are included in this series. No attempt has been made to describe in detail this interesting disease, as this has been admirably done by many. Those particularly interested are referred to the splendid work on "Pink Disease" by Rocaz, "Acrodynia", by Clement Cobb,[2] "Modern Concept of Acrodynia", by Pehu and Jarricot,[3] etc.

HISTORIES OF CASES

Table I records the most important points in the histories of this series. Twenty-two had their onset from January to June, 4 from July to December, inclusive. This coincides with the statements of others, that acrodynia finds its greatest incidence in the winter and spring months. Five cases came from the city of Regina, 21 from well-separated districts of Saskatchewan. Most of the parents were a good class of farmers, and appeared well acquainted with modern principles governing the care of children. The average duration of symptoms when first seen was two and one-third months. During this period, the majority had been under the care of two or three country practitioners at different times. In a few instances, because of discouraging progress, some had fallen into the hands of quacks. The average age at onset was nearly eleven months, the youngest having been five, the oldest, twenty-five months. Ten were males, 16 females. Sex does not appear to be of particular moment, as has been observed by different authors. For the most part these children started life in good condition, their average birthweight having been seven and one-half pounds. All but three had been fed at the breast, the average period of breast-feeding having been six and one-third months. The analysis of their feeding history

* A paper read at the Annual Meeting of the Canadian Medical Association, Calgary, June 22, 1934.

TABLE I.

HISTORIES

Case	Months Old At Onset	Sex	Duration of Symptoms	Birth Weight in lbs.	Present Weight in lbs.	Months Breast Fed	Cod Liver Oil or Viosterol	Orange Juice	Sun Light	General Diet	Family History	Antecedent Infection and Time From to Onset of Acrodynia	Complaints	Important Points in History
J.F. 1	13	F	2 mos.	6	16.4	6	0	+	0	Fair	Negative	Profuse nasal discharge one month.	Sore eyes; very cross.	Mother blames head-colds for sickness.
L.D. 2	8	F	2 mos.	9	12	8	+	+	0	Good	Tuberculosis	Pyelitis two months.	Sore eyes; not gaining; fretful.	Teething blamed by different doctors.
M.T. 3	15	M	3 mos.	6	22.8	6	0	0	0	Poor	Negative	0	Losing weight; fretful; sleepless.	Hands and feet always cold. Sleeps in strange positions.
E.C. 4	6	F	3 wks.	6.8	16.8	6	+	+	0	Good	Negative	Head-cold one month.	Sore eyes; fever spells; restless.	Sent in by doctor as a meningitis.
D.H. 5	5	M	6 mos.	7	16	2	+	+	0	Good	Negative	0	Sore eyes; weak back.	Sleeps well.
R.B. 6	13	F	8 mos.	9	19.13	13	+	+	0	Good	Prenatally poor	Enlarged glands one month.	Teeth falling out. Eczema.	Stopped walking at thirteen months.
A.F. 7	14	M	3½ mos.	10	21.8	1	0	+	0	Fair	Father, quinsy attacks	Abscess of throat one week.	Losing appetite; losing weight; poor sleeper.	Mother dates baby's sickness from time of father's quinzy.
A.G. 8	7	M	3 wks.	7.8	15.9	4	+	+	0	Good	Negative	0	Sore eyes; restless.	Swollen pinkish hands and feet.
J.W. 9	10	M	1 month	8.8	18.9	9	0	+	0	Fair	Prenatally poor	Swollen glands one month.	Irritable; light hurts eyes; losing weight.	Could walk with help at nine months. Now cannot.
C.A. 10	8	M	2½ mos.	8.8	14.9	8	0	+	0	Fair	Negative	Influenza two weeks.	Sore eyes; convulsions; losing weight.	Convulsions started same time as hands and feet became swollen.
A.S. 11	12	M	1 month	7	18.8	6	0	+	0	Fair	Negative	Head-cold and running ears one month.	Light hurts eyes. Whiney; restless.	Has never been without head-colds.
J.B. 12	10	M	6 mos.	6.8	16.11	9	+	+	0	Good	Prenatally poor	Frequent colds before onset.	Poor appetite; sweats too much; getting weak.	Mother states at times child can drink one pint of water.
M.M. 13	15	F	3 wks.	4.8	14	14	+	+	0	Good	Negative	Pyelitis one month; frequent colds.	Rash; sleepless; weakness.	Early signs developed while being treated for pyelitis in hospital.
M.E. 14	11	F	4 wks.	4.8	14	0	0	+	0	Poor	Negative	Boils ++ several weeks before onset.	Rash; weakness; not gaining.	Mother blames boils for sickness.
J.C. 15	25	F	1 month	7.8	24.5	1	0	+	+	Fair	Negative	Head-colds and discharging ears one month.	Sore eyes; irritable.	At times very dejected and sad.
D.G. 16	8	M	2 mos.	7.8	16.4	8	++	+	+	Good	Tuberculosis	Pneumonia two weeks. Colds.	Poor appetite; poor sleeper; weakness.	Acrodynia suspected while being treated for diarrhœa.
L.K. 17	9	F	3 wks.	4	13.9	8	+	+	0	Good	Negative	0	Rash. Fretty. Sore hands and feet.	Sleeps in funny positions. Not subject to colds.
R.S. 18	19	F	2 mos.	10	26.14	2	0	+	0	Poor	Negative	Influenza two weeks.	Eczema. Wheezing and cough. Weakness.	Rash began two months ago. Since very restless.
B.P. 19	8	M	2 mos.	7.10	20.12	3	++	+	0	Good	Negative	Frequent head-colds.	Not gaining; irritable.	For one month has been miserable and sleepless.
E.V. 20	10	F	1 month	9.8	15	9	0	+	+	Good	Negative	Severe nasal discharge one month	Poor sleeper; sore eyes; irritable.	Backward physically and mentally.
M.F. 21	7	F	1 month	8.8	13.8	0	+	+	+	Fair	Negative	Head-colds one month.	Sore eyes; irritable; rash.	
A.F. 22	14	F	2 mos.	9	25	0	+	+	+	Fair	Negative	Glands of neck one month.	Losing teeth; itch; sweats too much.	Mother brought in seven well enamelled teeth.
O.F. 23	8	F	6 mos.	6.8	17	9	+	+	+	Good	Negative	Head-colds few weeks.	Could stand at eight months; cannot at fourteen.	Frequent head-colds.
B.P. 24	12	F	2 mos.	8.4	20.12	3	+	+	+	Good	Negative	Very persistent head-colds one month.	Restless; weakness.	Sleeps in strange positions.
R.W. 25	8	F	2 mos.	6.8	19.1	3	+	+	0	Good	Negative	Head-colds.	Light hurts eyes. Eczema.	Feet hurt. "Gets mad" and pulls hair out.
Y.M. 26	7	F	1 month	8.8	14.6	7	0	0	0	Fair	Negative	Whooping-cough.	Irritable; getting weak; sleepless.	Marked perspiration.

revealed fourteen adequately, seven fairly well and five poorly fed. It might be noted here that it has been acknowledged for a long time that acrodynia is not a deficiency disease. The family history was as good as the average; the parents usually appeared to be healthy and rugged. In 20 cases they dated their children's sickness from the time of a respiratory infection, usually described as a "head cold", "grip", or "flu", two to four weeks prior to the actual sickness, one having blamed whooping-cough. The complaints in order of frequency were as follows: 14, change of disposition, such as irritability, fretfulness and depression; 12, sore eyes; 9, weakness, as inability to walk, stand or sit; 8, sleeplessness; and less often, rash, spoken of as eczema or itch; loss of weight; loss of appetite; loss of teeth; extreme sweating and attacks of fever.

After due consideration of these histories the conclusion was arrived at that these victims of acrodynia began life under good nutritional conditions, and that often in their first year, and nearly always in the winter and spring months, when it is accepted that resistance is lowest, they developed a respiratory infection which antedated their disease.

SYMPTOMATOLOGY

Table II deals with symptoms and findings. As 23 of these cases were kept in hospital for an average period of over three and one-half weeks, ample opportunity was provided for their clinical study and observations as to progress. Every case manifested hypotonicity, altered disposition, and sleeplessness. The hypotonicity varied in degree from beginning weakness in walking, standing and sitting, to extreme states of muscular disability, nearly all as a result adopting extraordinary postures, particularly when asleep. Altered disposition was manifested by irritability, fretfulness, sleeplessness, fits of depression, etc. All had forgotten how to smile and play. Superficial lymph nodes, enlarged on an average to the size of an almond, were present in 24 cases. The two patients who died showed a similar enlargement of all deep glands at autopsy, which histologically revealed chronic inflammatory changes. Erythema was present in 23 cases, in some appearing as a fine miliaria similar to that in scarlet fever, in others, morbilliform. In a few these rashes were intermittent and at times were associated with bouts of excessive sweating. The incipient cases, in particular, displayed transitory rashes difficult to diagnose. Twenty-one cases manifested the characteristic pink to blue swollen hands and feet; the remaining 5 of the series (the incipients) demonstrated nothing more than at times a suspicion of pinkness without swelling, about the fingers. In 14 of these 21 it was concluded that the hands and feet were painful, burning or itchy. In the other 7, however, because of poor cooperation, such subjective information was difficult to elicit. Naso-pharyngitis was present in 19 cases, and inspection of the tonsils in these suggested pathological conditions. Loss of appetite was present in 18 cases, but 2 of the series actually gained a little weight. Excessive sweating was prominent in 18 cases and was compensated for by extreme thirst; two infants, each drank sixteen ounces of water at one time. Desquamation was observed in 17 cases and appeared to depend on the degree of sweating. This latter sign, in conjunction with a previous scarlatiniform rash, had caused a diagnosis of scarlet fever to be made in two cases. Febrile attacks of a low order were present at some time in 17 cases, and were nearly always associated with a fresh naso-pharyngeal infection. Parents upon being closely interrogated remembered that at times in the early days of illness the child had been fevered. Often there was some sort of digestive disturbance, such as stomatitis, vomiting, constipation and diarrhœa. Constipation was more common than diarrhœa, though these in a few cases alternated. In several instances loss of appetite and diarrhœa occasioned extreme states of dehydration and acidosis, necessitating the frequent administration of glucose solution by the interstitial and intravenous routes. Photophobia and tachycardia were present in 15 cases. Reflexes were diminished in 14. Blood pressure, in 8 cases, averaged 121 systolic, a figure above normal for the age. Complications consisted of 6 pyurias, 5 pyodermias, 4 lower respiratory infections, as bronchitis and broncho-pneumonia, 2 nephritides, 1 endocarditis and 1 sinusitis. One patient was considered mildly rachitic. The average hæmoglobin figure was 67 per cent. One child exhibited a positive intradermal tuberculin reaction. All Wassermann tests were negative, and the average white blood count was sixteen thousand one hundred.

TABLE II

SYMPTOMS, SIGNS AND FINDINGS

Case	*J.F. 1*	*L.D. 2*	*M.F. 3*	*E.C. 4*	*D.H. 5*	*R.B. 6*	*A.F. 7*	*A.G. 8*	*J.W. 9*	*C.A. 10*	*A.S. 11*	*J.B. 12*	*M.M. 13*
Loss of hair	0	0	0	+	0	+	+	0	0	0	0	+	0
Loss of nails	0	0	0	0	0	+	0	0	0	0	0	+	0
Loss of teeth	0	0	0	0	0	+	0	0	0	0	0		0
Amount underweight when first seen, in lbs.	6.8	9	2	0	4.8	5.8	2½	2	2½	5.8	3	6	4
Photophobia	+	+	0	+	+	0	+	+	+	+	+	+	+
Altered disposition—fretful, sad, irritable	+	+	+	+	+	+	+	+	+	+	+	+	+
Sleeplessness	+	+	+	+	+	+	+	+	+	+	+	+	+
Hypotonicity	+	+	+	+	+	+	+	+	+	+	+	+	+
Abnormal postures	+	+	+	+	+	+	+	+	+	+	0	+	0
Diminished reflexes	0	+	+	+	+	+	+	+	0	+	?	+	0
Painful, itching, burning hands and feet	+	+	+	+	0	?	+	+	?	+	?	+	0
Swollen pink-red-purple hands and feet	+	+	+	+	+	+	+	+	+	+	+	+	0
Excessive sweating	+	+	+	0	+	++	+	0	+	0	+	+	0
Desquamation	+	+	+	0	+	++	+	0	+	0	+	+	0
Erythema—Sweat rash	+	+	+	+	0	++	+	+	+	0	+	+	0
Tachycardia	?	+	+	+	?	+	+	?	?	+	+	?	0
Blood pressure	?	?	?	?	130/?	?	120/?	?	?	120/?	?	?	?
Enlarged lymph glands	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomatitis	+	+	+	+	0	+	+	0	0	+	0	+	0
Loss of appetite	+	+	0	0	+	+	+	0	+	+	+	+	+
Vomiting	0	0	0	+	0	0	0	0	At times	At times	0	0	0
Constipation	+	0	+	0	+	+	0	+	At times	At times	+	+	+
Diarrhœa	0	0	0	+	0	0	0	0	At times	At times	0	0	0
Nasopharyngitis	+	0	+	+	0	+	0	+	+	0	+	0	+
Fever	0	0	0	+	+	+	?	+	0	0	?	+	+
Complications	Pyelitis	Pyelitis	Pyodermia	Nephritis Bronchitis	0	Boils Endocarditis	0	0	Nephritis	Pyelitis	0	0	0
Signs of rachitis	0	0	0	0	?	0	0	0	0	0	0	0	0
Hæmoglobin		78			40	60			78				
Old Tuberculin test		Neg.		Neg.	Neg.	Neg.	Neg.		Neg.	Neg.		Neg.	Neg.
Wassermann	Neg.	Neg.		Neg.	Neg.	Neg.	Neg.		Neg.	Neg.		Neg.	Neg.
White blood count	17,600	13,400		8,400	12,400	24,600	19,200		17,000	12,800		18,000	17,600
Urine	Pus++	Pus+++	Neg.	Albumin Casts	Neg.	Neg.	Neg.		Albumin Casts	Pus++		Neg.	Neg.
Remarks:	Urine Culture *B. coli*	Smear from boils Staphylococci.				Extreme thirst; could drink 16 oz. water at one time.				Urine Culture *B. coli*			Incipient Acrodynia; never had beefy hands or feet.

TABLE II—*Continued*

SYMPTOMS, SIGNS AND FINDINGS

Case	*M.E. 14*	*J.C. 15*	*D.G. 16*	*L.K. 17*	*R.S. 18*	*B.P. 19*	*E.V.20*	*M.F. 21*	*A.F. 22*	*O.F. 23*	*B.P. 24*	*R.W. 25*	*J.M. 26*
Loss of hair	0	+	0	+	0	0	0	+	+	+	0	0	+
Loss of nails	0	0	0	0	0	0	0	0	0	0	0	0	0
Loss of teeth	0	0	0	0	0	0	0	0	+	0	0	0	0
Amount underweight when first seen, in lbs.	4	4	3.4	3.8	2	1 lb. over wt.	5	3.8	½ lb. over wt.	4	1.8	0	3
Photophobia	0	+	0	0	0	0	+	+	0	0	0	+	0
Altered disposition—fretful, sad, irritable	+	+	+	+	+	+	+	+	+	+	+	+	+
Sleeplessness	+	+	+	+	+	+	+	+	+	+	+	+	+
Hypotonicity	+	+	+	+	+	+	+	+	+	+	+	+	+
Abnormal postures	+	0	+	+	0	+	+	+	+	+	+	+	+
Diminished reflexes	?	+	0	?	+	0	+	?	+	?	0	+	0
Painful, itching, burning hands and feet	0	+	0	+	?	0	+	+	?	+	0	+	0
Swollen pink-red-purple hands and feet	+	+	0	+	+	0	+	+	+	+	0	Swollen only	0
Excessive sweating	+	+	0	+	+	0	+	+	+	+	0	+	0
Desquamation	+	+	0	+	+	0	+	+	+	+	0	0	0
Erythema—Sweat rash	+	+	Transient	+	+	Transient	+	+	+	+	Transient	+	Transient
Tachycardia	+	+	0	+	+	0	0	+	+	+	0	+	0
Blood pressure	?	120/90	118/90	?	?	?	128/80	?	?	110/?	?	140/?	?
Enlarged lymph glands	+	+	?	+	+	0	+	+	+	+	+	+	+
Stomatitis	0	+	0	+	+	0	+	+	+	0	0	+	0
Loss of appetite	+	+	+	+	+	0	+	+	0	+	0	0	0
Vomiting	0	+	0	0	0	0	0	0	+	0	0	0	0
Constipation	+	+	0	0	+	0	0	0	+	0	0	+	+
Diarrhœa	0	0	+	+	0	0	0	+	0	+	0	0	0
Nasopharyngitis	0	+	+	0	+	+	+	+	+	+	+	+	+
Fever	+	0	+	+	+	0	0	+	+	+	0	+	+
Complications	Pyelitis Boils	0	Severe Bronchitis	0	Broncho Pneumonia	Frequent Chest colds	0	Pyelitis Pyodermia	Boils	Pyuria	0	Sinusitis	0
Signs of rickets	0	0	0	0	+	0	0	?	0	0	0	0	0
Hæmoglobin	65		69		51	65		89		60		68	78
Old Tuberculin test	Neg.		Pos.+	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.		Neg.	Neg.
Wassermann	Neg.		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.		Neg.	Neg.
White blood count	17,600		15,700	14,600	18,600	12,200	20,200	14,000	16,000	11,400		26,400	12,400
Urine	Pus++		Albumin ++	Neg.	Neg.	Neg.	Neg.	Pus++	Neg.	Pus++		Neg.	Neg.
Remarks:	Urine Culture *B. coli*		Incipient acrodynia; never had beefy hands or feet.			Incipient acrodynia; never had beefy hands or feet.		Urine Culture *B. coli*	Mother had seven of infant's teeth in her pocket		Incipient acrodynia; never had beefy hands or feet.		Incipient acrodynia; never had beefy hands or feet.

TREATMENT AND RESULTS

Two patients died; 24 recovered and, of these, 23 were followed for a lengthy period. One patient, known to have recovered, was not heard from after the first examination. Six of the 23 patients seen in 1926-27 were treated by what was considered to be ideal feeding, in association with artificial light therapy and heliotherapy. All 6 recovered, though very slowly, the average total duration of illness having been nearly eight months. The remaining 17 children, seen in the last seven years, had their tonsils and adenoids removed as soon as possible following diagnosis, this usually having been three or four days. Recovery was strikingly rapid in nearly every instance, the average duration of illness in this group having been three months, six days. Returning strength, returning disposition to show interest, play and smile, amelioration of symptoms in general, were presumed to be evidence of recovery. Only those who have observed these pitiable children through days of misery and wretchedness to those of rapidly returning happiness and strength can fully appreciate what removal of their source of poisoning means.

As was stated, there are physicians, in Canada and the United States, and more particularly in Europe, who do not accept the focal infection theory, and who adhere to conservative treatment. Might it be that European physicians have been seeing a different type of acrodynia from that seen in this country? The age incidence in this series, for example, appears very low as compared with that of overseas' cases. Pehu and Jarricot refer to, "The predilection of acrodynia for a certain age, during early childhood, from the age of six months up to the fifth year", and that "the disease is observed later in childhood, during adolescence and even in adults". Rodda[4] in his report of 17 cases, mentions one child six and one seven years of age. White,[5] of Buffalo, states, "Acrodynia may exist in adults as well as in children". After comparing symptomatology and findings of Australian and European cases with those on this continent, one is disposed to conclude that there is an unquestionable identity.

In his book on treatment, Rocaz states, "The nasopharynx is usually the site of an inflammatory reaction, especially in the early stages." What can this mean if not infection of tonsil and adenoid tissue? Throughout much of the literature and particularly that of Brown,[6] Byfield[7] and Rodda[4] one finds the same reference to upper respiratory infection. Many reports of cases remark on the onset with head-colds, or influenza, associated with elevated temperature, the succeeding attacks of nasopharyngitis with or without fever, the later findings of generalized adenopathy and leucocytosis, and the frequency of complicating infections. From such opinions and the experiences herein recorded, I feel that, whatever the bacteriology, acrodynia is the result of a toxæmia arising from infected tonsils and adenoids, or sinuses. Time does not permit treating of each case of this record separately, the evidence in favour of infection of these sites being etiological, however, may be appraised by a study of the following three cases.

ACRODYNIA FROM INFECTION

CASE 1

A.F., (7), male, 16½ months old. A typical case of acrodynia due to infected tonsils and adenoids.

Complaints.—Loss of weight and appetite; insomnia.

Family history.—Unimportant, except for frequent attacks of quinsy in the father.

Past history.—Birth-weight 10 pounds. He was strong and well prior to the present illness and walked at 13 months. The feeding was considered adequate.

History of present illness.—For 2½ months he had been losing weight and appetite; at nights was sleepless and during the day, irritable. The feet for several weeks had been becoming cold and clammy. The mother stated that the infant developed an "abscessed throat" one week after father's attack of quinsy, 2½ months previously.

Examination.—Two and one-half pounds underweight. His muscles were flabby and so toneless that the heels could be easily placed behind his ears. He lay all day with head buried in the pillow—photophobia; at night, sleepless and constantly rubbing his hands and feet and tearing at his body. The hands and feet were pink-purple to wrists and ankles and almost dripping moisture. A scarlatiniform rash was present over a moist body. There were loss of hair and loss of knee jerks. The heart rate was accelerated; blood pressure, 120 systolic. No elevation of temperature. All the laboratory work was negative, except that the white blood cells numbered 19,200. All the superficial lymph glands were enlarged, especially the cervical. The tonsils and adenoids were considered to be diseased.

Treatment.—For one month the child was given an intense course of heliotherapy, and on days when this was impossible ultra-violet radiation was substituted. At the end of 3½ months he was more miserable than ever. Following a transfusion his tonsils and adenoids were removed. Two weeks later he was trying to pull himself up the sides of his cot.

Comment.—This boy had a definite history of exposure to infection. He presented the classical picture of severe acrodynia. There was a spectacular recovery following removal of tonsils and adenoids.

CASE 2

M.F. (21), female, 8 months old. Acrodynia due to infected tonsils as well as adenoids.

Complaints.—Sore eyes, irritability and a rash.

Family history.—Negative.

Past history.—Birth weight, 8.8 lbs. Artificial feeding from the first. Her diet was well balanced.

History of present illness.—For one month she had been losing weight and had been very cross. Two weeks previously she had developed sore eyes, and about the same time a rash appeared on the body. Her hands and feet had been getting red and cold.

Examination.—Three and one-half pounds underweight. Marked fretfulness and gloominess was noted. Sleep was restless. She was unable to hold her head erect because of muscular weakness. The hands and feet were swollen, pink-blue and wet; definite pain present in these. The body was covered with a morbilliform rash. Sweating and thirst were excessive. The reflexes were diminished. Profuse nasal discharge. There was a general enlargement of all lymph nodes. Intermittent attacks of fever attributed to a pyelitis. While in hospital furuncles appeared from time to time. The tonsils were considered to be pathological.

Treatment.—Through a mistake the adenoids only were removed on admission to hospital . This brought about cessation of nasal discharge, but the symptoms continued as before. Three weeks later tonsils were removed. Three weeks later still the child was recovering nicely. The total duration of the illness was three and one-half months.

Comment.—This case would suggest that removal of adenoids alone is not sufficient to cure acrodynia.

CASE 3

R.W. (25), female, 10 months old. Acrodynia due to infected tonsils, adenoids and sinusitis.

Complaints.—That the light hurt the eyes; eczema.

Family history.—Negative.

Past history.—Birth-weight, 6.8 lbs. Mixed feeding had been employed. The diet had been adequate.

History of present illness.—For two months the child had had a head-cold. Since one month ago light had been hurting the eyes, a rash had been present, and the feet appeared to be painful. The child used to become angry and pull her hair out.

Examination.—No loss of weight. She was fretful in the daytime and sleepless at night. The musculature was hypotonic. She lay constantly with her head buried in the pillow—photophobia. The hands and feet were slightly swollen but not discoloured. Marked sweating of the body with a diffuse sweat rash. Blood pressure was 140 systolic; the heart rapid, about 140 at rest. Now and then she had an attack of fever. There had been a constant nasal discharge. White blood cells, 26,400. The tonsils were moderately inflamed.

Treatment.—Following blood transfusion, the tonsils and adenoids removed. Three weeks later there was no improvement and the nasal discharge was still marked. Drainage of the sinuses was established, and three weeks later the child had nearly completely recovered. The total duration of the illness was 3½ months.

Comment.—In this case removal of the tonsils and adenoids alone failed to completely remove infection. This case illustrates the need for draining sinuses when infected, in addition to removing tonsils and adenoids.

Is it not possible that those cases reported as not having been cured by removal of tonsils and adenoids might have had an associated sinusitis?

It seems to me the case against upper respiratory infection as being etiological in acrodynia is conclusive. One of the arguments, raised against operation in this disease is the hazard to a very young patient, already weakened and almost devitalized. I have felt for some time that even in their worst hours, these little patients are more resistant and tenacious of life than their funereal appearance would suggest. Of the seventeen cases treated here surgically, not one appeared any worse off immediately following than preceding operation. I contend again that in every case of acrodynia, as soon as it is diagnosed, all foci of infection should be removed, the questionable risks being prepared and supported with intravenous glucose and blood injections. Two patients recorded here died, one from pneumonia, one from endocarditis. These might have been saved if they had been seen earlier and operated upon.

INCIPIENT ACRODYNIA

Five cases now follow, none of whom presented the picture of advanced acrodynia, in particular, the "beefy" hands and feet.

CASE 4

M.M. (13), female, 16 months old. This child was being treated in hospital for a protracted pyelitis. Despite gradual lessening of her pyuria, she was becoming increasingly weaker, fretful by day and sleepless by night. A mild degree of muscular hypotonia, general enlargement of lymph nodes, and a transient rash, with a suspicion of photophobia, suggested early acrodynia. She had had repeated attacks of nasopharyngitis. The average of her leucocyte counts was 17,600. Rapid recovery followed removal of tonsils and adenoids. The duration of the illness was six weeks.

Comment.—At no time was there any swelling or "beefiness" of her hands and feet, or the picture of "pink-disease". It was felt that her pyuria as well as her acrodynia was caused by a toxæmia from infected tonsils and adenoids.

CASE 5

D.C. (16), a male, 10 months old. This child, while being treated in hospital for a very stubborn diarrhœa which followed on the heels of a broncho-pneumonia, displayed a peculiar transient scarlatiniform rash. In addition he was becoming increasingly fretful and sleepless, despite improvement of his gastro-intestinal condition. Very mild hypotonicity and peculiar sleeping postures created the suspicion of a developing acrodynia. Following removal of tonsils and adenoids his recovery was rapid. The duration of the illness was seven weeks.

Comment.—At no time were the classical "beefy" feet and hands displayed.

CASE 6

B.P. (19), a male, 10 months old. For several months the author had seen this well nourished child with repeated attacks of rhinorrhœa associated with otitis media. The tonsils always appeared inflamed and adenoids were present. Repeated complaints from the mother that he was developing loss of power to sit alone, broken sleep, and unhappiness, together with the appearance of several attacks of a measles-like rash created the idea that he had early acrodynia. Following removal of his tonsils and adenoids, in the face of a chronic bronchitis with fever, he made a splendid fairly rapid recovery. The duration of his illness was three months.

Comment.—He never had "pink œdema" of the hands and feet.

CASE 7

B.P. (24), a female, 14 months old. This child was healthy at twelve months. She was seen weekly the following two months because of a progressive failure to gain strength and weight. During this time she displayed several attacks of a peculiar rash difficult to

diagnose. The complaint of developing irritability and interrupted sleep in which she preferred the knee-chest position suggested a commencing acrodynia. Two weeks after the removal of an offensive pair of tonsils she was greatly improved, and one month later saw her happy and completely recovered. The duration of the illness was eleven weeks.

Comment.—She never had "beefy" feet and hands.

CASE 8

Y.M. (26), a female, 8 months old. The mother stated that this child had been developing weakness, irritability, and sleeplessness since an attack of whooping-cough one month previously. On examination a mild degree of hypotonicity, an antagonism to being handled, a mild erythema, and a slight enlargement of superficial lymph nodes suggested an incipient acrodynia. Two weeks after removal of tonsils and adenoids this little girl began to smile and play again. The duration of her illness was six weeks.

Comment.—She never had any of the classical signs of acrodynia, such as photophobia, beefiness of the feet and hands, excessive sweating, or body rash.

As noted, all 5 cases were treated by immediate removal of tonsils and adenoids. Recovery in every instance was rapid, the average total duration of illness being eight and one-half weeks. For the reasons that none of these 5 cases displayed the characteristic swollen and cyanosed hands and feet, the widespread cutaneous lesions, and the extreme weakness of the well-

TABLE III

TREATMENT AND RESULTS

Case	Died	Recovered	Weeks Hospitalized	Balanced Diet	Ultra-Violet Light	Removal of T. & A.	Duration of Illness: Before Treatment	Duration of Illness: After Treatment	Total Duration	Rate of Recovery	Remarks
J.F. 1		Yes	Yes 3	Yes	Yes	No	2 mos.	7 mos.	9 mos.	Very slow	Given sun baths all summer.
L.D. 2		Yes	Yes 1	Yes	Yes	No	2 mos.	5 mos.	7 mos.	Slow	Ultra-violet therapy did not appear to help.
M.T. 3		Yes	Yes 3	Yes	Yes	No	3 mos.	3 mos.	6 mos.	Slow	Ultra-violet therapy did not appear to help.
E.C. 4		Yes	Yes 3	Yes	Yes	No	3 wks.	6 mos.	6¾ mos.	Slow	Always considered to be full of adenoids.
D.H. 5		Yes	Yes 1	Yes	Yes	Yes	6 mos.	1 month	7 mos.	Rapid after T. & A.	Ultra-violet light for one month, with no improvement. Recovery rapid after removal of tonsils and adenoids.
R.B. 6	Yes		Yes 3	Yes	No	No	8 mos.	3 wks.	8¾ mos.	Died	Autopsy: Bacterial endocarditis; general adenopathy; nervous system negative.
A.F. 7		Yes	Yes 4	Yes	Yes	Yes	3½ mos.	2 wks.	4 mos.	Rapid after T. & A.	Given artificial and natural sun treatment without effect. Recovery rapid after removal of tonsils and adenoids.
A.G. 8		Yes	No	Yes	Heliotherapy	No	3 wks.	9 mos.	9¾ mos.	Very slow	Not seen after first exam. Report from mother tonsils not removed. About ten months sick. Never has been strong.
J.W. 9		Yes	No	Yes	Heliotherapy	No	1 month	8 mos.	9 mos.	Very slow	Refused operation. Report from mother —recovery very slow.
C.A. 10		Yes	Yes 5	Yes	Yes	Yes	2½ mos.	3 wks.	3½ mos.	Rapid	Convulsions stopped as acrodynia improved.
A.S. 11		Yes	No	?	?	?	1 month	?	?	?	Not seen or heard from since first examination.
J.B. 12		Yes	Yes 7	Yes	Yes	Yes	6 mos.	2 wks.	6½ mos.	Rapid	Very spectacular return of strength after operation.
M.M. 13		Yes	Yes 8	Yes	No	Yes	3 wks.	3 wks.	1½ mos.	Rapid	Rapid recovery after removal of tonsils and adenoids confirmed the diagnosis of acrodynia.
M.E. 14		Yes	Yes 3 days	Yes	No	Yes	1 month	2 wks.	1½ mos.	Rapid	
J.C. 15		Yes	Yes 1 day	Yes	No	Yes	1 month	1 month	2 mos.	Fairly rapid	Miserable appearance changed in two weeks.
D.G. 16		Yes	Yes 7	Yes	No	Yes	1 month	3 wks.	1¾ mos.	Rapid	General condition had improved one week after operation. "Incipient."
L.K. 17		Yes	Yes 4	Yes	No	Yes	3 wks.	1 month	1¾ mos.	Fairly rapid	
R.S. 18	Yes		Yes 1 wk.	Yes	No	No	2 mos.	6 days	2½ mos.	Died	Autopsy: Broncho-pneumonia and myocarditis; hyperplasia of all superficial and deep glands.
B.P. 19		Yes	Yes 6	Yes	No	Yes	2 mos.	1 month	3 mos.	Fairly rapid	Persistent bronchitis had cleared two weeks after operation. "Incipient."
E V. 20		Yes	Yes 2	Yes	No	Yes	1 month	1 month	2 mos.	Fairly rapid	
M.F. 21		Yes	Yes 1½	Yes	Yes	Yes	1 month	6 wks.	2½ mos.	Fairly rapid	Adenoidectomy only on admission, with no improvement. One month later tonsillectomy, recovery then rapid.
A.F. 22		Yes	Yes 3	Yes	No	Yes	2 mos.	3 wks.	2¾ mos.	Rapid	Remaining loose teeth became firm after removal of tonsils and adenoids.
O.F. 23		Yes	Yes 3½	Yes	No	Yes	6 mos.	2 wks.	6½ mos.	Rapid	
B.P. 24		Yes	Yes 1 day	Yes	No	Yes	2 mos.	3 wks.	2¾ mos.	Rapid	"Incipient."
R.W. 25		Yes	Yes 7	Yes	No	Yes	2 mos.	6 wks.	3½ mos.	Fairly rapid	Following removal of tonsils and adenoids profuse one-sided nasal discharge with no improvement. After treatment of sinus infection recovery rapid.
Y.M. 26		Yes	Yes 3	Yes	No	Yes	1 month	2 wks.	1½ mos.	Rapid	"Incipient."

advanced case of acrodynia, I feel satisfied that they were in the incipient stage. It might be mentioned here that some of the French writers classify this disease into abortive, nervous, and complete forms, in the former two of which cutaneous lesions may be absent or not prominent. I, myself, have felt that there may be many more extremely mild cases of acrodynia than suspected, such for example, as the sleepless child, the one who sleeps in strange postures, the one who, is cross and peevish, is off its food, is not gaining or is losing weight, who, at the same time, may show signs of a nasopharyngitis or a "cold", and who, from all of which makes a spontaneous recovery after a period of two or three weeks. Some might argue, therefore, that the five incipient cases reported here might have proved abortive or might have recovered quickly, had they not been operated on. However, while admitting this possibility, I think it very improbable that all would have failed to have developed into the mature disease. Judging from the similarity of the speed of their response to the removal of their foci of infection to that in acrodynia proper, together with other impressions, my conclusion is that they were commencing cases. After all, it must be admitted that in a disease of such chronicity as acrodynia there must often be a few weeks of slowly progressive changes, mild deviations from the normal, always noticeable to an observant and worried mother, though probably not so much so to a busy practitioner. It is this introductory stage, these incipient days, to which I would particularly direct your attention.

SUMMARY

Acrodynia is a disease, probably toxæmic in origin, having its focus in infected tonsils and adenoids or sinuses, and responding rapidly to removal of such.

The records of 23 cases have been submitted, 6 treated non-surgically, having an average period of eight months for the total duration of illness, and 17 treated by removal of tonsils and adenoids, and, in one case, drainage of sinus, having an average period of a little over three months for the total duration of illness.

Five incipient cases have been included in this series, all having been operated on, their total duration of illness having been eight and one-half weeks.

I would like to acknowledge the advice and help I have received from Drs. E. A. McCusker, G. J. McMurtry, and Harold Graham.

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MATERNAL WELFARE*

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WHILE the maternal death rate remains what it is in this country no apology need be offered for presenting a paper on the subject of maternal welfare.

Although our statisticians at Ottawa have gone to considerable pains to prove that we have succeeded in reducing our maternal mortality rate from 5.7 per thousand live births to 5 per thousand during the last five recorded years, Canada still occupies an unenviable position among the other nations of the world in this regard. It is futile for us to argue that the reason why our figures do not appear in a favourable light in comparison with those from other countries is because of different standards for compiling statistics. The fact still remains that too many young mothers are dying as a result of pregnancy and child-birth. Every maternal death is not only a domestic tragedy but also an economic loss to the community, and it is incumbent on us as medical men to make an extra effort to check this loss.

An analysis of the yearly reports of the Bureau of Statistics will readily show that

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nearly 1,200 Canadian mothers die every year as a result of pregnancy, and that the three most common causes of death are infection, toxæmia and hæmorrhage. It is not pleasant to be reminded that at least one woman in this country dies every day from puerperal infection and that one woman dies every day from one of the toxæmias of pregnancy, when at the same time we know that both infection and the toxæmias are to a great extent preventable. Preventable deaths should be prevented. This responsibility must be shared by both patient and doctor alike. This means that all possible information concerning pregnancy must be made available to expectant mothers and fathers, that perfect cooperation must exist between patient and doctor throughout the whole of pregnancy, and that both doctors and nurses must be skilled and diligent in the practice of their art.

There are still a few doctors in this country who do not recognize the necessity of pre-natal care; these men should not be practising obstetrics. There are others who practise it only in a casual way. To these I would venture to say that if every expectant mother were given adequate pre-natal care, and if proper attention were paid to the danger signals which give warning of the early and the late toxæmias, of placenta ablata and placenta prævia, our maternal mortality from these causes might be reduced by 70 per cent.

For example, with adequate supervision in the early months and specific instruction concerning diet, rest, elimination and exercise, the severer types of vomiting of pregnancy may be avoided. When these do occur they should be treated intensively at their inception. Four factors are usually involved: neurosis, dehydration, carbohydrate starvation and liver degeneration, in varying degrees of severity. These patients are best treated in hospital. The neurotic factor may be treated by isolation, rest in bed, and sedatives sufficient to induce sleep. The starvation and dehydration, as evidenced by scanty urine of high specific gravity containing acetone bodies and possible traces of albumin, should be treated intensively by the intravenous administration of 10 per cent glucose solution, as much as 3,000 c.c. being given in 24 hours. This may be repeated daily in varying amounts until diuresis is established, *i.e.*, when 1,000 c.c. of urine of specific gravity of 1010 or under are excreted in 24 hours and the acetone bodies have disappeared. Liver degeneration is evidenced by the presence of urobilin. When this does not disappear with intensive treatment and the patient does not improve after a week's treatment, as outlined above, the uterus should be emptied.

During the seven year period from January 1, 1927, to December 31, 1933, there were 184 cases of hyperemesis gravidarum admitted to the Metabolism Ward of the Burnside Obstetric Department of the Toronto General Hospital. Of these 98 were treated by rest, fluids, and ordinary nursing care, and 86 by intensive intravenous glucose medication. In 38 cases the uterus had to be emptied, while 9 of the total number died. Therapeutic abortion was done when the patient failed to respond to intensive treatment extending over a period of from seven to ten days. Those who died had received no pre-natal care, and were admitted to hospital with advanced liver degeneration.

HYPEREMESIS GRAVIDARUM

	1927	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*
Number of cases....	18	30	28	28	29	21	30
Treatment:							
Rest.....	14	18	22	14	11	8	11
+Intravenous....	4	10	4	9	17	13	19
Operative.....	1	2	2	10	10	4	9
Mortality.....	2	3	0	3	1	0	0

Then, too, early recognition of the danger signals of the late toxæmias — albuminuria, hypertension and œdema, occurring either singly or combined,—and prompt treatment of the condition which they represent will avert many tragedies and prolong many lives. This treatment consists in the main of rest in bed on a salt-free diet, together with proper and effective elimination. Where restlessness is present sedatives are given as necessary. A daily estimate of the blood pressure should be made and a record kept of the daily fluid intake and output. Careful and constant intelligent observation of the patient will enable the obstetrician to estimate her response to treatment, and where this response is poor to terminate the pregnancy before irreparable damage is done.

In the seven-year period mentioned above 238 cases of pre-eclampsia were admitted to our wards with 4 deaths; 2 following conservative treatment, 1 following Cæsarean section, and 1

on admission. Many more might have been lost had not the condition been recognized early and adequate treatment given.

PRE-ECLAMPSIA

	1927	1928	1929	1930	1931	1932	1933
Number of cases....	15	29	12	8	48	60	66
Treatment:							
Spontaneous.....	6	13	8	5	31	41	43
Medical induction.	1	4	2	1	6	7	6
Bag or bougie.....	5	8	2	1	8	11	17
Cæsarean section..	2	4	0	1	3	1	0
Not confined.....	1						
Maternal deaths.....	1	1	0	0	0	1	1
Conservative.....						1	1
Not delivered.....	1						
Cæsarean section..		1					
Still-births.....	1	9	1	1	9	10	9

When eclampsia occurs it may follow in the wake of pre-eclamptic toxæmia, or it may, and often does, come as a bolt from the blue. For a patient so afflicted quiet, isolation, and constant nursing care are essential. Hospital treatment is advisable, but not always possible. The first consideration is to quiet the cerebral irritation and control the convulsions. This may be done by morphine administered hypodermically in either quarter- or half-grain doses until the effect required is obtained, provided that the respirations do not fall below ten per minute.

We are following a modification of Stroganoff's treatment at the Burnside with fairly satisfactory results. Morphine, gr. ¼, is given hypodermically and sodium amytal, grs. 7½, intravenously when convulsions occur, both of which are repeated in four hours if necessary, and in spite of the fact that chloroform has a deleterious effect on the liver we do not hesitate to give a few drops of chloroform while hypodermics are being prepared or given, nor do we hesitate to give it in minute quantities while performing gastric lavage, administering enemas, or doing a venesection when indicated, or in administering any form of treatment which might tend to interfere with complete cerebral rest.

In the presence of oliguria or anuria we give 50 c.c. of a 50 per cent solution of glucose in an effort to establish diuresis.

Conservative treatment, which consists essentially of cerebral sedatives and elimination, has in our experience given the most satisfactory results, and when the convulsions have been controlled labour may be induced either medically or by means of the bag or bougie.

When the second stage is reached it is in our opinion advisable to shorten the labour by episiotomy and mid-forceps extraction.

Cæsarean section is neither necessary nor advisable except where there are indications that the labour will be difficult or prolonged, or where the patient remains in status epilepticus.

During the seven-year period already referred to 61 patients with eclampsia were admitted to the Burnside, of whom 8 died. The mortality from this condition is high, but adequate prenatal care will tend to prevent its development.

ECLAMPSIA

	1927	1928	1929	1930	1931	1932	1933
Number of cases....	6	6	8	8	11	14	8
Treatment:							
Spontaneous.....	4	2	4	5	5	6	6
Medical induction.	0	0	1	0	0	2	0
Bag or bougie.....	1	3	2	2	6	5	1
Cæsarean section..	1	1	0	1	0	1	0
Not confined.....			1				1
Maternal deaths.....	1	1	1	1	2	1	1
Conservative.....	1	1		1	2	1	
Not delivered.....			1				1
Cæsarean section..							
Still-births.....	3	1	1	2	4	4	

Whenever signs of the late toxæmias appear one should be on the lookout for accidental hæmorrhage. So often is hæmorrhage associated with hypertension and albuminuria that it must be considered as a complication of the toxæmias. Any hæmorrhage occurring in the last trimester must be regarded with suspicion, as it may endanger the life of both mother and child. When painless, it usually means placenta prævia, and when accompanied by pain it usually means partial or complete separation of a normally-placed placenta. This class of patient should be sent to hospital for observation and treatment. The logical treatment is to stop the bleeding, remove its cause, and combat the shock that may be present.

In placenta ablata conservative treatment can be successfully carried out in all but the cataclysmic type of case, and induction of labour may be easily accomplished by rupture of the membranes alone or together with the use of

PLACENTA ABLATA

	1927	1928	1929	1930	1931	1932	1933
Number of cases....	6	1	1	2	13	4	7
Type:							
Revealed.....	6	1	1	1	13	3	7
Concealed.....				1		1	
Treatment:							
Spontaneous.....	4	1	1	2	11	2	6
Rupture of membrane and bag...						1	1
Cæsarean section..	1						
Hysterectomy.....	1				2	1	
Transfusion.....	1					1	
Maternal deaths.....	2	0	0	0	0	0	0
Conservative.....							
Surgical.....	2						
Still-births.....	5	1	1	1	7	3	3

the hydrostatic bag in the majority of cases. The severe type must be dealt with by Cæsarean section or hysterectomy.

PLACENTA PRÆVIA

	1927	1928	1929	1930	1931	1932	1933
Number of cases....	2	10	10	12	14	6	19
Type:							
Central.....	1	1	4	7	2	2	4
Lateral.....	1	2	1		4	1	3
Marginal.....		7	5	5	8	3	12
Treatment:							
Spontaneous.....	1	6	4	1	6	1	8
Medical induction.				1		1	
Bag.....			1	2	6	1	4
Rupture of membranes, etc.....		2		1			2
Version.....			1	1			2
Cæsarean section..	1	2	4	6	2	3	2
Transfusion.....				3	1	1	1
Not confined.....							1
Maternal deaths.....	0	0	0	0	0	1	1
Surgical.....						1	
Conservative.....							
Not confined.....							1
Still-births.....	0	3	3	3	3	1	4

In placenta prævia the treatment varies with the parity of the patient, the location of the placenta, the time the hæmorrhage occurs, the condition of the cervix, and the amount of dilatation, as well as the amount of the hæmorrhage. Cæsarean section is the method of choice in the case of a primipara with a central placenta prævia. In other cases rupture of the membranes, together with version or the introduction of a hydrostatic bag, will control the hæmorrhage and start labour. In both placenta ablata and placenta prævia the ever-present danger of post-partum hæmorrhage must be kept in mind, and means should be ready at hand to combat it should it occur.

No greater tragedy, however, can occur in obstetrics than death from puerperal infection. More than one-third of all maternal deaths in Canada are due to this cause, and more than one-third of these are due to attempts at abortion, during which infection is introduced into the genital tract.

It is now almost universally conceded that puerperal infection usually comes from without, and that its source may be found in the nasopharynx of some or any person coming into more or less immediate contact with the patient. It has been found by many observers that of all persons attending midwifery cases from 5 to 30 per cent carry hæmolytic streptococci in their throats. Therefore, those who are suffering from either acute or chronic rhinitis, pharyngitis, tonsillitis, or laryngitis, or who have been affected by influenza or the "common cold", are potential carriers of infectious organisms and are sources of danger to parturient women. Such persons should not be allowed in the same room with the expectant mother, either during labour or during the lying-in period. The organisms may be air-borne or introduced by direct contact into the genital tract of the patient, either at or after confinement. Puerperal septicæmia is, therefore, in most cases preventable. The infection is usually due to the *S. hæmolyticus*, which may be found in the cervix or in the blood stream. In about 20 per cent of all such cases no organisms are found by the ordinary methods, but the clinical picture is that of puerperal sepsis and the condition must be treated as such. Again, in about 20 per cent of all cases there is no history of previous pelvic examinations; the labour has been spontaneous, and there have been no cervical or perineal tears. That such infections can and do occur in apparently healthy women, without any outside interference whatsoever, must lead inevitably to the conclusion that there is something faulty in labour-room technique. This should be as complete in all its details as that of the operating room. At least four-ply gauze masks should be worn by all attendants and by the patient herself, and should cover the nose as well as the mouth, otherwise their value as a preventive agent is nullified. All sterilizers should be tested as a

routine, and the only safe way to discover defects is to have a daily bacteriological test.

The patient herself should be prepared for labour as she would be for a perineal operation. The disinfection of the vagina has always been a problem. Iodine, alcohol, mercurochrome, green soap and many other solutions have been tried, but there does not appear to have been very much difference in the results of any one method of procedure. The infection generally comes from without, not from within, the vagina, and aseptic protection of the vagina and perineum must be carried out as carefully post partum as during labour.

PUERPERAL SEPSIS

	1927	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*
Number of cases....	12	1	2	5		4	6
Cervix positive....	10		2	4		1	6
Cervix negative...				1		2	
Blood positive....	0	1	1				
Blood negative....	1		1	3		1	4
Cervix, not recorded	2	1				1	
Blood, not recorded	11			2		3	2
Treatment:							
Serum, intramuscular...	1	1		2		1	4
intramuscular and intravenous	5		2	1			
No serum.....	6			2		3	2
Transfusion.....	3		1				
Maternal deaths.....	0	1	0	1		2	1

So far as we have been able to determine there is no specific treatment for this condition. However, as a result of investigations carried out by Dr. Dafoe at the Burnside in 1924 we have evolved a method of treatment which has reduced our mortality rate by more than one-half.

We have divided our cases into three classes, mild, moderate and severe. In no case do we curette the uterus except where there is severe uterine bleeding which threatens the life of the patient. Mild cases are treated expectantly, with rest in bed, easily digested diet, iron and strychnine, and ordinary nursing care. Moderate cases are given the same treatment, with the addition of 30 c.c. of scarlet fever antitoxin intramuscularly in each gluteal region, repeating the injections within twenty-four hours if necessary. Severe cases are given 30 c.c. scarlet fever antitoxin into each gluteal muscle, and 30 c.c. intravenously, and, in addition, blood transfusions are given as considered necessary. As a rule no reaction follows the intra-muscular injection of the antitoxin, but when given intravenously care must be taken to inject it slowly into the vein and to dilute it with normal saline solution.

Before the serum is used the sensitivity of the skin should be tested by a few minims injected under the skin. If the result is a positive reaction the patient should be desensitized by gradually increasing small doses of the serum hypodermically, starting with 0.25 c.c., increased to 0.5 c.c. every half hour until no reaction is obtained. Then the treatment may be undertaken as above described.

This treatment is of value in the early stages of the disease, but has proved ineffective when the patient has had her infection for more than ten days.

The real defect in the modern day practice of obstetrics is lack of vision. The teaching today is much more exhaustive and the facilities for the practical application of this science are infinitely greater than ever before. But besides the acquisition of knowledge it requires imagination, nicety of judgment, and infinite patience to become a master of the art of obstetric practice. When once the art is mastered, and when expectant mothers learn that cooperation is more to be desired than self-reliance, our maternal death rate will approach an irreducible minimum.

ANTIRABIC VIRUS VACCINE IN THE TREATMENT OF SCIATICA AND MIGRAINE.—Haguenau, Cruveilhier and Nicolau report further trials of treatment in morbid conditions of the nerves by injections of neurotropic virus. They use the virus vaccine employed by prophylactic treatment of rabies at the Pasteur Institute, giving a course of daily injections for fifteen or more days. In patients with chronic arthritis of the hip or vertebral rheumatism, in pains after herpes, in trigeminal or facial neuralgia, and in tabes or general paresis the treatment was practically useless. In 5 out of 7 cases of severe sciatica, however, which has proved refractory to other treatments, the virus vaccine injections led to speedy cure. Twelve bad cases of migraine were treated; cure was obtained in 6 and partial amelioration in 2. The writers are satisfied that, apart from relief of symptoms, the majority of patients showed after their treatment a slow but striking improvement in general health; in several instances a patch of alopecia was found to disappear, and the hair and beard of a diabetic patient regained their colour.—*Bull. et Mém. Soc. Méd. des Hôp. de Paris,* May 21, 1934, p. 671.

RECENT ADVANCES IN OBSTETRICS AND GYNÆCOLOGY*

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I PROPOSE firstly to deal with the recent advances in obstetrics, and to consider these advances under the following headings: (a) advances associated with pregnancy; (b) advances associated with labour; (c) advances associated with the puerperal period. I will discuss the advances in gynæcology in the latter part of the paper.

THE ADVANCES ASSOCIATED WITH PREGNANCY

Pre-natal care.—(1) Visits to the physician.—This subject and its important bearing on the maternity patient has been so thoroughly and repeatedly brought to our attention that it really seems superfluous even to mention it. However, there have been several very important advances made in the ante-partum care of the maternity patient. We request first of all that she should seek pre-natal care as early as possible. During the second month is none too early. The first visit of the patient should include the following points—general history, general physical examination; obstetric history, past and present, and a special investigation of the pelvis; blood pressure, urine analysis, weight and estimation of hæmoglobin. If the hæmoglobin is under 60 per cent a complete blood examination should be made. At each subsequent visit, which would be every two weeks for the first eight months, and once a week during the last month, the following points should be noted—weight, temperature, pulse rate, blood pressure, urine analysis, height of fundus, position of baby, and position and rate of the baby's heart.

(2) Diet.—During the first half of pregnancy the patient is given extra fluids and carbohydrates in an attempt to diminish nausea and vomiting. During the last half of pregnancy she is advised to restrict table-salt to some degree, and to somewhat decrease the intake of protein. Otherwise she is permitted to have plenty of fruit and vegetables. The relationship between the intake of iodine and still-birth has been called to our attention by Kemp.[1] The results of this investigation seem quite decisive proof of the value of an adequate iodine intake for the expectant mother. The relationship between an adequate supply of vitamins and normal pregnancy is fairly definite. Vitamin A seems essential in building up the mother's resistance against various infections. Mellanby's[2] work on this subject is interesting. It seems almost imperative to add some form of cod-liver oil to the diet of an expectant mother. The intake of vitamin A during the first half of pregnancy is considerably below par, due to the usual nausea and gastrointestinal disturbances. Many of these patients cannot tolerate fats in any form. In such cases cod-liver oil concentrates may be used if necessary. Vitamin D is essential for normal calcium metabolism. There is a decrease in the blood calcium during the latter half of pregnancy according to the investigation by Nicholas *et al.*[3] This is in part due to the calcium requirement of the developing baby. Many of the younger mothers show decalcified areas in their teeth. Calcium deficiency may also have a bearing on the toxæmias of pregnancy, according to Daly.[4] A normal calcium content seems to have an influence on the onset of labour at the proper time, also according to Daly.[5] It seems of vital importance, therefore, to maintain a fairly normal calcium content for the pregnant woman throughout her pregnancy.

Vitamin E has something to do with the normal growth of embryonic tissue. At the present time Dr. E. M. Watson, of the University of Western Ontario, and myself are investigating the clinical value of vitamin E in cases of threatened abortion. We are attempting to select cases in which there is no very evident reason for an abortion to occur. Our results so far have been most encouraging. We have made a study of 40 cases. The results are as follows:—

* Read at the Sixty-fourth Annual Meeting of the Canadian Medical Association, Calgary, June 20, 1934.

(a) Abortions (1-10)
1. Successful pregnancies.. 19
2. Unsuccessful pregnancies 3
3. Expectant cases..... 5 (All these are now past the time when abortion usually occurs.)
(b) Primary sterility—6 cases, all unsuccessful.
(c) Secondary sterility—4 cases, all unsuccessful.
(d) Threatened abortion—3 cases, 2 successful, 1 unsuccessful.

Vogt-Moller[6] reported twenty cases of habitual abortion treated with vitamin E. Seventeen of these were carried to full term. He reports also 2 successful cases out of 5 of female sterility treated with vitamin E. Dr. Watson, my colleague, suggests that vitamin E should be known as the "ante-abortion vitamin" rather than "ante-sterility vitamin". Our contention is that in a certain number of these cases of abortion there is a dearth of vitamin E resulting ultimately in death of the embryo. The dead embryo is ultimately aborted.

(3) Blood pressure.—The blood pressure reading should be taken at each visit. An elevated systolic pressure is usually the earliest indication of an onsetting pre-eclamptic condition. The systolic reading is of more importance as an indication of a toxæmia than is the pulse pressure, according to Browne.[7] Any systolic blood pressure over 130 mm. of mercury should be considered abnormal, unless it is known that there is some other reason for the elevation.

(4) Weight.—The following were the conclusions on weight-taking of Harding and Van Wyck.[8]

1. Gains up to 5 lbs. per month in pregnancy can be considered as normal. It will be rare to find toxæmias developing in this group.
2. Gains from 5 to 8 lbs. per month should be regarded with suspicion. Such patients should be placed on a salt-poor diet and restricted in caloric intake. They should be watched more closely than the strictly normal woman.
3. Gains of 8 lbs. and over per month indicate a potential toxæmia. The closest supervision should be exercised over such patients.
4. The gains in weight have preceded the more usual signs of toxæmia, *i.e.*, albuminuria, œdema, hyperpiesis.
5. If we can prevent or control water retention the toxic process may be averted.
6. The small number of toxæmias in this series (about 1 per cent) justifies the practice of weight-taking in pre-natal care. Although definite signs of toxæmia developed in a few patients, none exhibited convulsions. The maternal mortality was zero.

I have been personally using this method as a guidance in pre-natal care over a period of some few years. The average gain of my private patients during the first eight months was three and a half pounds per month. A patient with an onsetting pre-eclampsia would show an abnormal gain of weight, the most striking example of this being a primiparous patient within three weeks of full term who made a gain in weight of nine and three-quarter pounds in two weeks. The blood pressure was 148/90. The urine showed a four-plus albumin. The toxæmia was controlled, following which a medical induction was carried out about a week before full term.

(5) Hæmoglobin estimation.—This should be done at least monthly. The importance of this has been admirably shown by Witts.[9] According to this author womankind usually shows a hæmoglobin below normal between the ages of puberty and the menopause. The most marked decrease is evidenced during the child-bearing period. Since the appearance of this work I have been conducting routine hæmoglobin estimations on all of my private patients. I find that over 50 per cent of the maternity patients require treatment. The usual treatment is massive doses of iron, up to 100 gr. a day. The average dose is 70 to 80 gr. a day. The average time required to raise the hæmoglobin 20 per cent was five to six weeks. The prescriptions used were as follows.

℞ I.

Ferri et Ammonii Citratis	ʒ IX.
Glycerini	ʒ I.
Elix. Lact. Pep.	℥ I.
Aquæ ad	fl. ℥ VIII.

Fiat Mistura.
Sig. ʒ II in water after meals and at bed-time.

℞ II.

Caps. Blaud	gr. X.

Sig. One cap. t.i.d.p.c.

Fullerton,[10] working under Professor L. S. P. Davidson in the University of Aberdeen, has conclusively shown that ferrous sulphate, gr. 9 per day, will give equally as good results as the massive doses of iron and ammonium citrate. The cost is about one penny per day with ferrous sulphate, compared to two and a half pence per day with iron and ammonium citrate. It is also more convenient for the patient and has advantage of not discolouring the tongue and mouth.

At the present moment Dr. H. A. Cave is carrying out a thorough investigation of hæmoglobin in our maternity clinic. I personally believe that a maternity patient with hæmoglobin considerably below normal is much more likely to present complications during preg-

nancy, labour, and the puerperal period. The relationship between the toxæmias of pregnancy and low hæmoglobin has fairly definitely been established. The influence of a low hæmoglobin on abortion and miscarriage is no doubt one to be considered. The relationship of a low hæmoglobin to puerperal sepsis is self-evident. The relationship between a low hæmoglobin and still-birth is intimate. A baby born under this condition is handicapped during birth because of anoxæmia. The degree of anoxæmia will vary with the degree of microcytic anæmia.

(6) Presentation of baby.—Accurate determination of the presentation of the baby is necessary during the last four weeks of pregnancy. Breech presentations should then be converted into head presentations by means of external version whenever possible. Some occipito-posterior positions can be corrected before labour by the application of a padded binder. The pad used is a folded towel placed between the anterior superior spine of the ilium and the baby's shoulder. The presenting part of the baby should become engaged in the pelvis about one month before full term in primiparous patients. In about 19.5 per cent of primiparous patients the presenting part does not engage firmly before the onset of labour. Failure of engagement stimulates the obstetrician to discover the reason. In such cases an attempt should be made to ascertain the relationship of the baby's head and the mother's pelvis by the Munro Kerr method. Accurate pelvic measurements, external and internal, are essential for each maternity patient before the end of the eighth month.

(7) Sex determination.—Work on this subject has been carried out in various centres during the past few years. We have a research worker on this subject at present and his conclusion thus far is that the microscopic determination gives a correct diagnosis of sex in 84 per cent of the cases. A complete report of this work will be published in the near future.

The complications of pregnancy.—The toxæmias constitute the most common complications occurring during pregnancy. These include vomiting, pre-eclamptic toxæmia, eclampsia, nephritic toxæmia, and low-reserve kidney. Adequate pre-natal care has noticeably decreased the number of toxic complications during pregnancy. It will remain very difficult to satisfactorily treat the toxæmias of pregnancy until the exact etiology has been worked out. Numerous theories have been advanced, and almost as many methods of treatment have been tried. I purpose, therefore, to crystallize some of the more promising ideas which have been handed down to us during the last few years on this subject.

The etiology of severe vomiting of pregnancy is unknown. The indications that the vomiting has become definitely toxic are: (1) persistent vomiting; (2) oliguria and the presence of urobilin; (3) persistent elevation of the pulse rate; (4) loss of body weight.

The treatment consists in isolating the patient and restricting visitors. Repair the loss of fluid and feed the patient intravenously either by the constant or the intermittent method. Glucose solution, 2,000 c.c. of a 10 per cent solution, and whole blood transfusions are used for this purpose. Colonic irrigations are given daily. Sedatives are given if necessary. The vast majority of cases will respond to this treatment. It requires four or five days' trial treatment before one is in a position to decide whether or not the patient is improving. We have not found it necessary to do a therapeutic abortion for pernicious vomiting in our clinic during the past six years.

Pre-eclampsia is the most common complication of pregnancy during the last three months. It is evidenced by: (1) an abnormal gain in body weight (5 to 8 lbs. per month); (2) elevation of the systolic blood pressure; (3) albumin in the urine; (4) swelling of the hands and feet.

The most satisfactory treatment for this type of case at present seems to be summed up as follows: (1) rest in bed until the symptoms subside; (2) restrict the intake of sodium chloride considerably, and proteins slightly; (3) administer a strong alkaline solution by mouth, *e.g.*, potassium citrate, gr. 40, sodium bicarbonate, gr. 20, calcium sodium lactate gr. 7½; (4) magnesium sulphate as a laxative daily. Since using this alkali treatment I have been able to control the pre-eclamptic patients much more quickly. The use of alkalies is rather ancient, but has recently been reviewed thoroughly by Daly.[11]

Eclampsia continues to occur in maternity cases, but not nearly so frequently as some years ago. This is no doubt due to the better care of the mothers before labour. Clinically,

eclampsia may be classified as acute and chronic. The acute form occurs suddenly without many prodromal signs and symptoms. Seventy per cent of these cases occur in primiparous patients. The chronic form comes on more gradually, with characteristic prodromal signs and symptoms. Seventy per cent of this class occur in multiparous patients. The prognosis of the acute type is much more serious than that of the chronic. In general the treatment of the two types is similar. Eclampsia is called the "disease of theories", and for some time it might have been called the "disease of variegated treatment". Even though we have not yet settled the etiology of eclampsia we are a little more unanimous concerning its treatment. Some modification of the Stroganoff method is most commonly used at present. Cæsarean section is now only used in the treatment of eclampsia where there is some other definite obstetric reason for doing it. Cæsarean section is therefore not used as part of the treatment for eclampsia.

The aims in treating the eclamptic patient are: (1) to produce absolute rest and quietness; (2) to eliminate water and toxins; (3) to assist in delivery by the gentlest means possible.

The modification of the Stroganoff method which I personally like is as follows.

1. Absolute rest in a quiet darkened room.

2. Morphine, gr. ¼, with magnesium sulphate, 2 c.c. in a 50 per cent solution, given as often as required to control convulsions and restlessness. If necessary this may be given until the respirations are down to 10 or 12 per minute. If morphine does not control restlessness or convulsions, 2 c.c. of paraldehyde solution always assures the patient of rest for some hours. This is given intravenously.

3. Free sweating with dry heat, one hour out of three.

4. Five hundred to 1,000 c.c. of blood are withdrawn, and Daly's alkaline solution is given intravenously. Part of the withdrawn blood is sent to the laboratory for blood chemistry estimation.

5. Fifty c.c. of a 25 per cent solution of glucose is given intravenously four hours later.

6. An indwelling catheter is inserted, instead of doing repeated catheterizations.

7. Enemas and stomach lavages are not used during the acute stage of eclampsia.

8. At the end of ten or twelve hours' treatment, labour is initiated by means of a hydrostatic bag if the patient's condition has not improved.

9. During labour delivery is assisted by means of low forceps under gas-oxygen anæsthesia.

With reference to nephritic toxæmia no particular advances have been made, except that some nephritic patients may be guided through a pregnancy without danger to life, providing the kidney function has been thoroughly estimated periodically before and during pregnancy.

Low-reserve kidney. — This group forms a debatable one, but it is generally conceded, and I personally believe there is such a kidney. The kidney threshold is low, the strain of pregnancy is usually sufficient to cause albumin in the urine, some elevation of blood pressure, and œdema. These patients require more than ordinary pre-natal care. They require extra rest and special diet. The babies may come rather prematurely, but many more viable babies would be obtained from this class of patient if we recognized the low threshold of the kidney and put the patient on exceptional supervision early in pregnancy.

Placenta prævia is a complication of pregnancy that requires careful management. The advancements made within recent years are: (1) The diagnosis of placenta prævia by x-ray. This use of the x-ray has been quite thoroughly described by Professor Munro Kerr,[12] of Glasgow. The technique is reasonably simple and the results fairly satisfactory. (2) The general feeling that, wherever possible, the best results are obtained by adopting the low-flap Cæsarean section for the method of delivery.

THE ADVANCES ASSOCIATED WITH LABOUR

These are rather noteworthy.

1. Analgesia.—This field has been fairly well covered, but unfortunately as yet we have no perfectly satisfactory analgesic for the first stage of labour. I mean by this that we have at present no drug or combination of drugs that will entirely relieve the pain of labour and at the same time be perfectly safe for mother and baby. There are two groups of drugs that are extensively used for this purpose, namely, the sedatives and the hypnotics. Some workers use one or other of these groups, while others attempt to combine the two. The sedative group

comprises such drugs as morphine, pantapon and heroin. The hypnotic group includes the bromides, chloral hydrate, and the barbiturates. There are now about thirty-five recognized barbiturate preparations on the market, and before this paper is read in June there will probably be a few others added to the list. The barbiturates are hypnotics; it seems, therefore, that we cannot expect to rely upon them alone to give us satisfaction as obstetric analgesics.

2. Mechanical delivery.—The forceps in obstetrics today is not playing so great a part as it did some years ago. This is in part due to the efforts put forth by the various teaching centres throughout the country in emphasizing the eminent dangers to both baby and mother when the forceps is used. Fifty-one per cent of the stillborn babies, or babies that die within the first week after birth, are found to die from cerebral hæmorrhage. The most common cause of this is a forceps delivery or a breech extraction. I claim, therefore, that an advancement has been made in this respect.

Cæsarean section has become more commonly used in certain districts during the past few years. There is no doubt that it is resorted to at times unnecessarily. However, of recent years considerable progress has been made in placing this operation in its proper place in obstetrics. This is particularly true since the introduction of the low-flap operation. This permits us to make use of Cæsarean section in many cases where the classical section would be contraindicated. I have found the low cervical operation so much more satisfactory in every way that I have adopted it as my routine when Cæsarean section is required.

3. Resuscitation of the new-born.—Graham[13] has shown that one of the most common causes of death of the new-born is anoxæmia. The baby's heart may be beating reasonably well, or feebly, and yet the baby fails to breathe. The proper use of the insufflator, using a mixture of 90 per cent oxygen with 10 per cent carbon dioxide, will nearly always initiate normal respirations. In marked cases of respiratory failure a mixture of oxygen with as much as 30 per cent of carbon dioxide may be used to stimulate respirations. I have personally found this method much safer and more certain than any other. I feel that the two most important points in resuscitating the new-born baby are, namely, to remove the mucus from the mouth and air passages, following with insufflation of its lungs with a mixture of oxygen and carbon dioxide.

ADVANCES ASSOCIATED WITH THE PUERPERAL PERIOD

1. Nursing difficulties.—One of the common nursing difficulties is that the mother is unable to nurse her baby satisfactorily. It seems better results would be obtained if the baby was permitted to nurse from both breasts, not more than three minutes from each breast every eight hours, for the first twenty-four hours. Then allow the baby to nurse four or five minutes from each breast for the next twenty-four hours. When the quantity is insufficient, the baby should be allowed to continue to nurse from each breast at each nursing. Macomber[14] has recently shown that mothers on a low-protein diet do not nurse their babies as well as mothers on an adequate supply of protein. I think that we can safely add considerably more protein to the mother's diet during the nursing period, and also during pregnancy.

2. Puerperal sepsis. — Prophylaxis against puerperal sepsis includes adequate pre-natal management, a scientific delivery, and scientific post-partum care. If the temperature rises to 101° or over at any time during the puerperal period, particularly during the first week, proper steps should then be taken at once to make sure of the diagnosis. Such a patient should have cultures taken from the cervix at once, in order to ascertain the type of organism present. This of course applies to the case in which some other obvious cause for the elevation of temperature is not present. If the organism is a hæmolytic streptococcus the patient should be given early and adequate treatment. I personally believe at the present moment we have no better means at our disposal than saturating the patient with scarlet-fever antitoxin, and giving her moderate or small repeated blood transfusions. In severe cases the scarlet-fever antitoxin may be given in 30 to 40 c.c. doses intravenously. In moderate cases the scarlet-fever antitoxin may be given in 60 to 90 c.c. doses intramuscularly. The blood transfusions would be given in 200 to 500 c.c. doses daily, if necessary. A daily estimation of the hæmoglobin is done as a guide for the blood transfusions. In cases where an increase in the

drainage of lochia is necessary glycerine and carbolic acid, in the proportion of 16 of glycerine to 1 of carbolic acid, is used. Some form of vitamin A concentrate, *e.g.*, radiostoleum, is given in large doses (Mellanby[15]).

THE ADVANCES IN GYNÆCOLOGY

(*a*) Menstrual disturbances.—The work carried out in recent years and the work going on at the present moment in the field of the endocrine glands is tremendous. The number of articles appearing in the literature is rapidly increasing. From this volume of work a certain number of scientific facts are filtering through. Clinically, we have already glandular substances which produce results. Within the next few years we are very hopeful that many more of the unsolved problems of the endocrine glands will be unravelled. I propose here to touch briefly on the clinical aspects of the subject. We will begin with—

1. Amenorrhœa.—Whether this be primary or secondary, it may be due to a disturbance in the endocrine glands. When all other possible causes are ruled out, we usually assume that the underlying cause is a disturbance in the endocrine function. The glands most likely concerned are the pituitary, ovary, and thyroid. A basal metabolic rate should be taken at the outset. If this is out more than 25 definite assistance may be expected from thyroid therapy. If it is within normal limits thyroid therapy may be justly used along with the other treatment. The most satisfactory product for stimulating menstruation that I have used is "Œstroform", made by the British Drug Houses. Each c.c. contains about 1,000 rat units. A more recent product of the same firm contains 10,000 international rat units per c.c. The estimated required dose is 400,000 rat units.

2. Dysmenorrhœa.—When no obvious cause is present the alkaline treatment of these patients seems to give very good results. The treatment is commenced about two or three days before the period starts, and is continued for about half the duration of the period. Sufficient alkali is given to keep the urine on the alkaline side. At present I am using potassium citrate, gr. 40, sodium bicarbonate, gr. 20, and calcium lactate, gr. 7. In other cases dilatation of the cervix, up to a No. 10 Hegar, with a tight packing of the uterine cavity and cervix with sterile gauze, seems very satisfactory. The gauze is left in for about four or five days.

3. Sterility.—About 25 per cent of the cases of sterility are due to some fault on the part of the husband. I personally make it a routine to check the husband in all cases of sterility where I am unable to find an evident cause in the female. Insufflating the Fallopian tubes with air or lipiodol is a very satisfactory method of checking the patency of the tubes. In certain cases the vaginal secretion is strongly acid. An alkaline douche taken at bed time may permit the spermatozoa to live long enough to gain entrance into the cervical canal. During the past two years, Dr. E. M. Watson and myself have been making use of a concentrated form of vitamin E in cases of sterility. Our paper on this work will appear later.

(*b*) Treatment of prolapse.—The term "prolapse" in gynæcology usually has reference to descent of the uterus. This, however, is usually accompanied with some degree of prolapse of the anterior and posterior vaginal walls. The prophylactic treatment includes, first of all, scientific obstetric work. The most exaggerated degrees of prolapse are found in women who have had mechanical deliveries. A plea is made here again for us to refrain from mechanical obstetrics in so far as possible. The use of a proper-fitting pessary during the late puerperal period will often avoid future descent of the uterus and vaginal walls. The surgical management of prolapse of the uterus and vaginal walls varies in different centres. I find that the majority of these cases may be dealt with entirely by means of the vaginal route. The Fothergill operation, or a modification of it, gives excellent end-results.

(*c*) Treatment of cancer of the cervix.—In reasonably early cases the most satisfactory end-results are obtained from adequate surgical treatment, supplemented with radium and x-ray. In moderately advanced cases surgery is seldom if ever used. We depend here upon radium and the x-ray.

We are still unanimous at least in one important point concerning cancer, namely, that the patient's best and, likely, only hope for cure is an early diagnosis. Most of us believe today that heredity is playing a part. With these two facts before us, a small group of men in London are at present attempting to get the necessary persons interested in the establishment

of a Cancer Bureau of Statistics. This bureau should preferably be so situated that it would be accessible for information to every Cancer Clinic in the world. We believe that by so doing certain families could be forewarned concerning the possibility of a certain type of cancer occurring in the members of that family. This would lead to the special guidance and observations necessary to detect the early appearance of cancer.

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THE TREATMENT OF CORNEAL INFECTIONS*

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THE treatment of corneal infections begins properly with their prevention, but of this little need be said before such a group. It might be emphasized, however, that there should be no pain persisting twenty-four hours after the complete removal of a foreign body. The superficial wound of an uncomplicated foreign body has always healed within this time, and persistent pain means either retention of some foreign material, beginning infections or that rare but troublesome affliction, recurrent erosion of the cornea. If all patients are instructed to report when any pain is present the day after removal of a foreign body, such complications will be seen in their incipiency and may be nipped in the bud. Removal of chronically infected lachrymal sacs or establishing their drainage, will also prevent many corneal infections, of course, and this is sufficient reason for always advising it.

A *serpent ulcer* does not present the typical picture in its earliest stages. The appearance of the tiniest grey or yellowish infiltrate after the removal of a foreign body, or at the site of one unremoved for several days, nearly always means invasion of the cornea with pyogenic organisms, and is hence a serpent ulcer in embryo. Some such infiltrates will heal under atropine or dionin, or, equally well on no treatment at all. It is a tribute only to our luck when they do so, however, as others equally inoffensive-looking will go on to the typical picture of serpent ulcer. Hence it seems best to treat such infiltrates directly as soon as they are seen. Pure trichloracetic acid is well adapted for such direct application. If two or three drops of water are added to as many crystals as will cover the bottom of a wide-mouthed glass-stoppered bottle, a syrupy fluid results which may be applied very delicately to minute lesions. It turns the tissues white wherever they are touched, so that one always knows when a satisfactory application has been made. While it destroys bacteria and tissue in direct contact with it, no deep necrosis is produced, as may occur with phenol or nitric acid. An excellent way of applying this or other drugs to the cornea is on a fine cotton point wound on a pointed applicator. We have had applicators made for this with the tip etched, but a sharpened wooden applicator will do as well. The cotton point is cut off so that no loose hairs of cotton are left and only enough acid is used to make a fine line when tried on the surgeon's finger-nail.

For early and minute infiltrates one such application is usually all that is required. Where much pain and congestion are present a

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cycloplegic is advisable, but if the infiltrate is small homatropine will usually be sufficient. In older and larger infiltrates, atropine and heat are employed from the outset. Scrapings from the infiltrate will usually show pneumococci, and when this is determined, or even when it is only suspected, optochin (ethyl hydrocuprein) is definitely indicated. Solutions of the hydrochloride are often employed by instillation, but when one thinks of the dilution which occurs in this way it seems doubtful if any specific effect is really secured. Such an effect is secured, however, if a few granules of optochin hydrochloride are applied directly to the ulcer on a fine cotton point. They must be applied accurately, as the drug in this strength abrades the corneal epithelium where it is touched. After such an application to the whole infected area the lids are held open for a minute, and then the area is flushed with saline. Such a treatment, repeated in twenty-four hours if necessary, will sterilize many infiltrates which have reached the proportions of a definite ulcer. If optochin is not at hand a thorough application of trichloracetic acid is often effective. Where the infiltrate or ulcer is deep or has an overhanging border it will be best to apply the drug on a sharp hard point barely covered with cotton, so that pressure may be employed to reach the deeper layers. Other strong antiseptics may give equally good results. I have used pure lysol and phenol for reasons of necessity, but am more afraid of phenol than of trichloracetic acid, because its effect cannot be so well judged. Iodine may be employed in the form to be described later. Mercurochrome in solution has, I think, proved disappointing to most of us. When used in powdered form, however, it is an excellent agent for the disinfection of ulcers. A kind of mud is made by grinding up a tablet with a few drops of water and this is applied on a fine cotton point. A dense red stain of the affected area results, whose colour may persist for several days, and I have seen this prove very effective in ulcers which were resistant to other treatment. The important thing is that one should not be afraid of applying strong agents directly to the cornea, if they are applied properly, in the stage at which an ulcer may be actually sterilized. Reliance on the instillation of antiseptics and atropine really leaves the battle entirely to the patient's resistance, and where infection has a foothold in the avascular cornea the odds are much against the patient.

If in spite of several direct applications of an active disinfectant the infiltrate increases in size, or an active infection is indicated by resistance of the pupil to atropine, there is no reason for losing more time before resorting to what I consider the most important single procedure in the treatment of corneal infection. I refer to opening of the anterior chamber, by whatever method one is accustomed to do it. When a patient is first seen with a typical serpent ulcer, this is the routine procedure which is done. I am purposely emphatic in this, as I have seen so many service cases in which this has been postponed and in which I have been obliged to do it under much more unfavourable circumstances.

Opening the anterior chamber is done with the purpose of taking the tension off the cornea and allowing the influx of a new supply of lymph containing antibodies from the limbus. If done by the ordinary technique of a limbar paracentesis, the immediate effect is excellent and may be sufficient for a small ulcer. In more serious ulcers, however, the procedure should be repeated daily, and this necessitates careful anæsthesia and fixation each time it is done. Opening the chamber with a fine cautery-point through the floor of the ulcer has the advantage that the opening remains open for several days. Such an opening causes a very deep central scar, however. It is preferable to the Guthrie-Saemisch incision, I believe, in large ulcers covering most of the central cornea, as it is safer. In ulcers of moderate size, however, and in most ulcers, in fact, I prefer a method which my father first employed, and which he called "delimiting keratotomy". This is an incision through the thickness of the cornea, tangential to the advancing border of the ulcer, usually its central border. Such an incision may be reopened daily very easily. Besides this advantage it was thought that the epithelium which grows rapidly into such a cut and perhaps also the cut itself acts as a barrier to the spread of infection. This seems to be indicated by certain ulcers in which the cut is not quite long enough and the ulcer spreads around one end of the cut while never spreading directly across it. After good anæsthesia, including the injection of a drop of 2 per cent cocaine over the opposite rectus muscle for fixation, the ulcer is treated thoroughly with an antiseptic, preferably optochin.

A thin very sharp knife is entered with the edge upwards, and held nearly parallel with the cornea so as not to wound the lens. It is passed into the chamber under the edge of the ulcer, and brought out just beyond its opposite limit, when the incision is completed. Escape of aqueous humour follows, and much of the hypopyon is usually evacuated, though this is not important. The pain which follows this release of tension may be minimized by a previous injection of morphine and by completing the incision as slowly as possible. This is important, also, to prevent a prolapse of iris. Atropine is always used previously, however, and prolapse very rarely occurs.

The day following such a keratotomy usually sees a distinct improvement in the appearance of the eye. In spite of this, the chamber is reopened, after a few drops of 1 per cent butyn, by touching the edge of the incision with a spud, allowing the chamber to empty slowly. The edge is previously touched with iodine, to prevent the carrying of infection into the eye and any portions of the ulcer which look active may first be touched by iodine or optochin. That infection is never carried into the eye seems to depend, however, on the fact that the aqueous humour flows out and carries any organisms out with it. I have never seen the lens become infected as a result of the keratotomy. The chamber is reopened daily until healing is practically complete, usually in 5 to 8 days.

A small group of cases recently reported with Gradle[1] shows the results obtained in serpent ulcers first seen at various stages. In all these the process stopped when the keratotomy was done, the resulting vision depending on the previous extent of the ulcer. Keratotomy seems like a radical procedure, and there is a tendency in the minds of most men to put off such a procedure until other means have been exhausted. I have never been sorry for having done it, however, in a serpent ulcer, and in the early days, when it was not a routine procedure, have often been sorry for having postponed it. The scar of the incision, though made in the clear cornea, is insignificant compared to that made by the ulcer in its otherwise almost inevitable advance. Further details of this procedure, as compared with the Guthrie-Saemisch incision and their methods of producing hypotony will be found in the article referred to.

General methods of treatment should not be neglected; these include foreign protein injections and cod-liver oil or viosterol. I feel that local measures, however, are in this condition of much more importance, and that the fate of the eye will in most cases depend chiefly upon them.

Of other types of corneal infection probably the most important is the *dendritic*, or *herpetic ulcer*. Here the problem is quite different, as ulcers due to the herpes virus are superficial, spreading rapidly over the corneal surface but seldom involving the deeper layers and never perforating. Here chemical or physical agents may be employed to sterilize the ulcer in any stage. In most cases the early use of iodine will stop the progress of the ulcer. Tincture of iodine is difficult to apply, so a thick syrup of iodine is made by adding 5 drops of tincture of iodine and 5 drops of glycerine to 10 grains of iodine crystals, which are ground up in the solution, leaving some iodine undissolved. Such a syrup is easy to apply accurately with a fine cotton point, and will itself follow the track of the ulcer so as to cover the whole eroded surface. The lids are held open for thirty seconds, when the eye is flushed with saline. One or two such applications are sufficient in many simple cases.

Since there are a certain number which resist such treatment, the use of ultra-violet irradiation is now employed as a routine from the outset. This agent is not advised for serpent ulcers, as the depth of the infection must prevent effective action of the light in most cases, but in herpetic lesions it has often seemed of definite value. If the Birch Hirschfeld arc-lamp with uviol filter is at hand, treatments of 5 to 10 minutes every day are employed, while with other filters much less time is necessary. Thus, with the Corning 958 A. filter 60 seconds is an effective dose and should not be repeated for 2 to 3 days. With the water-cooled mercury arc the dose depends on the lamp, but is usually not over 1 minute.

Certain dendritic ulcers which do not respond well to iodine have apparently been stopped by the mercurochrome paste previously described. In 4 specially intractable cases, with a tendency to recur after almost healing on the usual treatment, roentgen irradiation was employed. Thirty to 40 per cent of a skin dose was employed, and only one treatment was given, so that no danger to the lashes or the lens was involved. All cases healed at once, and for some unknown reason the well-known tendency of such ulcers to recur later has not yet manifested itself in any of

them. Though extreme sensitivity of the herpes virus to roentgen rays has been reported, it is hardly likely that such small doses could have proved an effective viricide, and it seems more probable that a stimulating effect on the corneal epithelium was the more important factor. In ulcers of this type, and others where healing is delayed, the use of cysteine or glutathione, recently applied to ulcers of the skin, may find an important application.

Delimiting keratotomy is never employed in dendritic ulcer, as there seems to be danger in opening the deeper layers of the cornea to invasion by the virus. In a few bad cases simple paracentesis at the limbus has been employed, and this additional stimulus to the corneal defense mechanism has apparently been responsible for the prompt healing in these cases.

Simple or *catarrhal ulcers,* while usually not involving danger to sight, are often a source of prolonged discomfort. They often occur in the course of Morax-Axenfeld conjunctivitis, and while they heal when the conjunctivitis is properly treated, this may require considerable time. They heal much more promptly if 30 per cent zinc sulphate is applied carefully to the ulcer on a fine cotton point. In the commoner type of simple ulcer, which we found was often due to a streptococcus of low virulence, one or two applications of pure trichloracetic acid on a hard-pointed applicator results in healing within one to three days. Atropine is seldom required but homatropine for several days gives relief.

Phlyctenular keratitis depends on systemic causes and should be controlled by systemic treatment. Unfortunately, it does not always behave according to the rules. Whenever a phlyctenule breaks down on the cornea an opening is made for secondary organisms, and either these or the process itself may leave dense central scars. Systemic treatment should, of course, include proper diet, limitation of carbohydrates, use of viosterol and cod-liver oil, and general artificial light-baths where sunlight is not available. The local use of ultra-violet irradiation has not proved successful in this condition, as a rule, nor has the use of tuberculin, in my experience, though this differs with that of Lemoine and others. We have been using calcium in the form of calcium gluconate, in doses of 60 grains three times a day. The inhibiting effect of calcium on other exudative processes, such as those of eczema, is now established, and a similar effect seems to shorten the course and lessen the symptoms in phlyctenulosis. While calcium gluconate is well tolerated, a cheaper form of calcium, such as calcium lactate or simple chalk, is perhaps as effective.

Atropine is given locally in all cases during periods of activity. As corneal lesions appear they are touched with trichloracetic acid and usually heal quite rapidly. Occasionally, perhaps due to secondary infection, a phlyctenule assumes a purulent aspect or extends deeply into the cornea. In such cases keratotomy may stop the process and save serious central scarring.

Such a case was George K——, a boy of 8, who had been treated for typical phlyctenules several times with success. A central infiltrate appeared and progressed in all directions very rapidly. Delimiting keratotomy was performed under general anæsthesia and the chamber was reopened twice a day for one week. During the first few days the cornea became more opaque, but then began to clear, and after two years vision is 20/50, corrected. Three days after the first keratotomy a similar central ulcer appeared on the opposite cornea and progressed rapidly. Keratotomy was performed promptly and the ulcer healed in five days. Vision is now 20/20.

In infants, when a central phlyctenule develops, the usual applications are difficult or impossible without anæsthesia. In such cases it is often best to open the chamber with a very fine knife through the ulcer after the application of trichloracetic acid. Healing is usually prompt, and the keratotomy need seldom be repeated.

A rare type of ulcer, but one which has presented as almost uniformly bad prognosis, is Mooren's ulcer, the so-called rodent or chronic serpiginous ulcer. There is no time to describe this, but most of us know its irresistible progress over the cornea, healing, and becoming vascularized as it goes, never perforating, but leaving a dense scar which almost annihilates vision. Having had two cases which healed with 20/25 and 20/40 vision after a delimiting keratotomy, I cannot forbear to mention them.[2] The cut is made just inside the most active portions of the ulcer, and is reopened daily for two weeks or longer. Another typical case healed with 20/30 vision under a sliding conjunctival flap which was drawn well past the border of the ulcer and made to adhere by the application of trichloracetic acid. The flap is still in place, and is not particularly sightly, but I have feared to remove it. Keratotomy is much simpler and less disfiguring, and apparently offers better chances of success, since many authors report failure after a conjunctival flap.

Ulcers in trachoma usually heal on atropine, cessation of copper treatments for a time, removal of trichiasis, and a few applications of trichloracetic acid. Ultra-violet irradiation has also proved useful in this type of ulcer. Anyone who has lived in a trachomatous country, however, has seen occasional cases in which a number of small infiltrates arise simultaneously at the edges of the pannus and fuse rapidly to form a ring ulcer. Such an ulcer, when treated by the usual measures, results in almost complete opacity of the whole central cornea. I have seen a number of these heal with keratotomy and report a typical case.

Mark H——, a man of 60, had been treated for trachoma for 12 years. The lids had apparently completely healed 18 months before. According to his ophthalmologist, the right eye had developed a ring ulcer which required enucleation after three months. When seen by me, the left eye had shown ulceration for six days. A ring of infiltration surrounded the cornea except for an area above the centre, 3 mm. long. About 5 mm. of the central cornea was not ulcerated but was very hazy. Vision was, counting fingers at 2 feet. Keratotomy was performed at once at the central border of the infiltrated area nearest the outer limbus. This was kept open for nine days when the central cornea had cleared and the infiltration seemed to have stopped. The cut was allowed to close, but a new infiltration promptly appeared near the lower limbus, so a new opening was made here and kept open seven days, when the ulcer no longer stained with fluorescein. There has been no recurrence and vision one year later was 20/25.

It is difficult to summarize these random remarks, I may only emphasize once more the importance of prompt action in cases of corneal infection. An ulcer may be easily sterilized when it is very small by direct application of antiseptics, but not so easily if one waits till it is large and deep. When the deeper layers of the cornea are invaded the best thing that can be done is to aid the eye's defences by opening the anterior chamber. Delimiting keratotomy, when carefully performed, is a safe and effective way of doing this, and allows a repeated reopening of the incision till healing is assured.

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THE VALUE OF MAGNESIUM CHLORIDE AS AN AID IN THE TREATMENT OF CANCER

(A PRELIMINARY REPORT)

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A PATIENT, male, aged 43, consulted me, complaining of a husky voice of eight months' duration. His family history was most unfavourable; his mother, two maternal uncles and an aunt had died of cancer.

Examination of his larynx revealed a warty growth on the anterior third of the right vocal cord, the edges of which were indurated, and there was a small growth on the left vocal cord. The Wassermann test was negative; no evidence of tuberculosis.

The growths were destroyed by electro-dessication with the mono-polar current. Radium treatment was given when the reaction from the dessication had subsided. Five months later the voice was good and the larynx appeared normal, but on account of the family history, in consultation with an eminent radiologist, it was deemed advisable to give him a course of a modified Coutard's x-ray treatment. After the first few treatments a persistent cough developed; they were therefore discontinued. The cough became very distressing and œdema of the larynx developed with great respiratory embarrassment. Death appeared to be imminent. To relieve the respiratory distress a low tracheotomy was performed, and it was also hoped that by placing the larynx at rest the œdema would subside. Unfortunately, it became worse. An x-ray of the chest showed what appeared to be metastases, and laryngectomy, which had been considered, was rejected. This opinion was confirmed by Dr. G. E. Hodge. On account of the persistent and exhausting cough, painful deglutition, and the septic condition of the patient, as shown by the elevation of temperature, accelerated pulse, the pungent odour from the mouth and tracheotomy wound, a laryngo-fissure was considered to be the only operative procedure advisable.

The operation, under avertin and chloroform anæsthesia, disclosed a diffuse cancerous infiltra-

tion and œdema of the larynx involving the epiglottis, the ary-epiglottidean folds, the arytenoids, the true and false vocal cords, the subglottic space, and the trachea as far down as the tracheotomy wound. The inner surface of the cricoid was denuded of its perichondrium. The laryngeal landmarks were obliterated. Two denuded pieces of cartilage were removed from the larynx,* and three large foul-smelling sloughs were removed from the subglottic space with forceps and suction. In order to gain free access to the upper part of the trachea the cricoid cartilage was incised with the radon knife and this space carefully fulgurated. A deep ulcerated area on the right side of the larynx was fulgurated. The larynx and trachea were then packed with iodoform gauze saturated with tannic and gallic acid and treated as an open wound. A feeding tube was passed through the nose into the œsophagus to a depth of ten inches.

There was some improvement in his general condition following the operation, which was attributed to the removal of the septic foci, but in spite of daily dressings and meticulous care, the laryngeal picture remained about stationary. The patient's condition was grave and the prognosis gloomy. As a last resort I decided to administer magnesium chloride subcutaneously and to use it combined with pepsin as a spray for the pharynx, with pepsin and glycerine as a dressing in the laryngeal cavity. After the first injection the patient stated that his teeth felt "as if they were steel". Daily examination of the larynx through the laryngeal mirror showed a gradual disappearance of the œdema of the epiglottis and larynx. The infiltration began to subside after the tenth treatment. After two weeks of the treatment the skin looked white and almost chalky, and the patient no longer appeared septic. The mucous membrane of the pharynx was whitish, and that of the epiglottis and larynx was white and glistening, suggestive of the deposition of the magnesium salt in the tissues. The tracheotomy wound, which had been moth-eaten and succulent in appearance, was now firm and healthy-looking; the granulations in the laryngeal opening were white, healthy and glistening. The odour and cough had almost disappeared. The improvement was pronounced, and, in order if possible to speed it up, I prescribed magnesium chloride by mouth. Two days later the man developed general malaise, with loss of appetite, and the tracheotomy wound had lost its healthy appearance. The magnesium chloride was discontinued and a calomel purge given. Forty-eight hours later he again felt comfortable, and the appearance of the mucosa of the larynx and the tracheotomy wound gave the clue to the amount of magnesium chloride that could be tolerated and assimilated by the patient. Fifteen days after the treatment was begun the feeding tube was removed and deglutition gradually returned to normal. One month later the œdema had disappeared from the epiglottis and the ulceration of the mucous membrane of the larynx had disappeared. When the tracheotomy tube was removed the patient could whisper; abduction and adduction were slowly returning. One month and two days from the time the treatment was first started the patient left the hospital. At the time of writing, two months later, he has gained over fifteen pounds, his appetite is excellent, and the tracheotomy opening healthy, but the larynx is almost immobile. I attribute this fixation partly to the fact that during the time I was absent on my vacation he was not encouraged, nor did he attempt to use his voice. I hope to overcome this by ionization and suitable dilatation. He comes to my office thrice weekly, driving his own car, and is well enough to supervise his business for a part of the day.

The lead to find an antidote for cancer has baffled the scientific world for many years. Numerous antitoxins and preparations have been tried, but up to the present time, apart from surgery, electro-therapeutics and radiology, no specific remedy had been found to combat this universal scourge.

The importance of the bio-chemical approach to the study of cancer has been fully stressed by Prof. Pierre Delbet, Superintendent of the Cancer Institute, Hôpital Cochin, Paris. The *Stockholm Weekly Journal,* in June, 1931, published a most enlightening article by him, the title of which was "Take magnesium and escape cancer". Here he advocated as a prophylactic measure the administration of magnesium to all persons in and past middle life. By his experimental work he showed that soil, water and food stuffs deficient in magnesium salts predisposed to cancer. In order to check up his gross findings he inoculated a series of rabbits with cancer virus. Fifty per cent of these he treated with

* The pathologist reported the necrotic tissue removed from larynx as containing carcinoma cells.

magnesium chloride, all of which recovered, while the majority of the untreated rabbits died.

Apart from Delbet's findings there are many fundamental biological reasons why magnesium chloride should have been chosen. Firstly, the kinship of mankind and plants. This may be exemplified by the spectroscope, by which it is found that while porphyrin is the base of red blood cells it is also the base of the green colouring matter in plants. The two porphyrins differ mainly in that the blood porphyrin is combined with iron while the plant porphyrin is combined with magnesium. Dr. Colvin Coulter, of Columbia University, found further evidence of this kinship in porphyrin which he extracted from cytochrome, a pink pigment existing in the cells of virtually all those living things which use oxygen. This cytochrome, he finds, is combined with magnesium, so that a porphyrin-magnesium combination is not an exclusive patent of the chlorophyll green plants but belongs also to the red-blooded races. Parsons[1] in his book "Fundamentals of Biochemistry" says "Not only hæmoglobin but many other animal pigments are porphyrin derivatives, as are also cytochrome and several other of the oxidation catalysts of the cell. So also is chlorophyll which is responsible for the photo-synthetic activities of green plants. It seems as if during the course of evolution the same piece of chemical structure had been utilized for a variety of very different functions".

Secondly, according to the latest views, magnesium exhibits its maximum valence in combination with chlorine. Magnesium chloride is the ideal oxidizing and reducing agent in the tissues. This combination has apparently been selected by nature to stimulate to the maximum inter- and intra-cellular change. The great versatility of this combination to reduce and oxidize brings about a complete ionization, and therefore a normal functioning of the cells.

Ionization is one of the greatest forces of nature and demonstrates to us the great importance of employing the right dosage and screenage when radium and x-ray are used in the treatment of disease. The ideal radiation includes a rest period, as witnessed by the ionization of the earth by the sun during the day, the night supplying the period of rest. The lesson to be learned from this is that too constant and too heavy radiation should be carefully avoided, otherwise it will defeat its purpose, namely that of restoring the normal electric tension and equilibrium of the cells. According to the latest authorities, all metals are in a constant state of ionization, and this constant interchange between the electro-positive and electro-negative forces is essential to the maintenance of life. Every cell in our body is electrically charged, and as long as oxidation and reduction are not interfered with, the health of the body will be maintained. The versatility of the ions in this process is a most fascinating study, and reveals hitherto undreamed of secrets of nature. Further, in a broader sense, nature employs oxidizing and reducing agents to purify the air, the soil, and the water, as well as our bodies. The sun's rays ionize the earth, charging it with electricity, thus maintaining a normal balance between the solid, fluid and gaseous elements.

The significance of the electro-chemical laws and their practical application in medical therapeutics have opened up new vistas of thought, and give one a broader conception of life in all its various processes. After all we are only the microcosm of the macrocosm, and when we are no longer able to receive the electrical charge from the Cosmos "we are changed in the twinkling of an eye" and proceed onward and upward into the Universe of Light—"The things which are not seen are eternal".[2]

No report of this case would be complete without acknowledging my great indebtedness to Dr. George Little and Dr. Herbert Ross, whose cooperation and assistance were invaluable and to Mr. R. King, the assistant pharmacologist at the Western Division of the Montreal General Hospital.

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BACTERICIDAL PROPERTIES OF SODIUM FORMALDEHYDE SULPHOXYLATE IN VIVO*

(A PRELIMINARY REPORT)

BY I. M. RABINOWITCH, A. C. CORCORAN, J. A. DAVIDSON AND L. J. RHEA,

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SANFORD ROSENTHAL, of the United States Public Health Service, has recently[1] reported the results of his experimental work upon the use of formaldehyde sulphoxylate ($NaHSO_2$. CH_2O. $2H_2O$) in mercurial poisoning. Very favourable results were obtained by using this compound on dogs which had been given mercuric chloride. Rosenthal has also reported his experiences with the drug in ten cases of acute mercurial poisoning (with mercuric chloride). All of these patients recovered without developing appreciable kidney damage.[2] The drug is a very powerful reducing agent, and when injected into man has been found to be more stable and less toxic than either of its components.

One of us (I.M.R.) has recently used this drug on a patient in the Montreal General Hospital who was admitted with acute mercurial poisoning (mercuric chloride), with good results. The patient fully recovered, with no complications. In this case it was noted that the urine obtained *before* the administration of the sulphoxylate compound acquired, on standing, the typical ammoniacal reaction and odour and the rich bacterial growth characteristic of decomposing urine; while the urine collected shortly *after* the administration of the drug, when left at room temperature, remained quite clear, retained its acid reaction, and only a few organisms grew in it. A sample of this urine collected in an ordinary urine bottle with no precautions with regard to sterility has now been kept for more than two months at ordinary room temperature, and is still acid, clear, and shows a low bacterial count. In view of these findings and the chemical nature of the formaldehyde sulphoxylate, it was thought that this substance might be of value in bacterial infections.

As a preliminary study we have used the drug in cases of pyelitis and have undertaken

TABLE

SHOWING THE EFFECTS OF SODIUM FORMALDEHYDE SULPHOXYLATE ADMINISTERED INTRAVENOUSLY UPON THE BACTERIAL CONTENT OF THE URINE IN PYELITIS AND PYELONEPHRITIS

(Arranged from lowest to highest bacterial count obtained prior to the administration of the sulphoxylate)

Exp.		*Hour*	*Bacterial Count*	*Remarks*
1	Before	9.00 a.m.	150,000	Diagnosis:—Chronic pyelonephritis. Organism:—*B. lactis aerogenes.*
	After	4.00 p.m.	1,500	Dose:—10 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 10.00 a.m.
2	Before	9.00 a.m.	198,000	Diagnosis:—Chronic pyelonephritis. Organism:—*B. lactis aerogenes.*
	After	5.00 p.m.	28,000	Dose:—20 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 10.30 a.m.
	Before	9.00 a.m.	446,000	Diagnosis:—Pyelitis. Organism:—*B. coli.*
	After	4.00 p.m.	498,000	Dose:—10 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 9.10 a.m.
	Before	9.00 a.m.	500,000	Diagnosis:—Pyelitis. Organism:—*B. coli.*
	After	4.00 p.m.	5,000	Dose:—10 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 10.00 a.m.
5	Before	9.00 a.m.	2,200,000	Diagnosis:—Chronic pyelonephritis. Organism:— *B. lactis aerogenes.*
	After	5.00 p.m.	8,500	Dose:—20 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 10.30 a.m.
6	Before	9.00 a.m.	2,940,000	Diagnosis:—Chronic pyelonephritis. Organism:— *B. lactis aerogenes.*
	After	4.00 p.m.	9,000	Dose:—10 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 9.30 a.m.
7	Before	9.00 a.m.	40,000,000	Diagnosis:—Pyelitis. Organism:—*B. coli.*
	After	4.00 p.m.	960,000	Dose:—10 grams sulphoxylate in 500 c.c. physiological salt solution, given intravenously at 9.30 a.m.

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some animal experiments with it. In two cases of pyelitis in which the bacterial content of the urine was determined before and after the intravenous administration of the drug we were impressed with its bactericidal properties. Our technique in general was as follows. In each case a catheter specimen of urine was collected under strictly aseptic precautions. This was sent immediately to the Department of Pathology for bacteriological examination. Formaldehyde sulphoxylate was then administered intravenously. At different intervals thereafter specimens of urine were collected and examined bacteriologically. The results of the use of this drug in 7 experiments with pyelitis are shown in the accompanying Table. The bacterial counts are arranged from the lowest to the highest obtained prior to the administration of the drug. It will be observed that while the bacterial count prior to the administration of the drug varied from 150,000 to 40,000,000 per cubic millimetre, in only one case did the drug fail to exert a definite bactericidal action.

It is a well recognized fact that the bacterial content of urine in pyelitis and pyelonephritis fluctuates widely. This variable has been considered in the interpretation of our data. In one case, for example, it was found that, although prior to administration of the sulphoxylate the bacterial content fluctuated widely throughout the day, it was never less than 1,000,000. Following intravenous administration of the drug in this case the count decreased rapidly to 2,000.

A number of other variables have as yet to be investigated. It has been found, for example, that the rate of elimination of the drug varies widely in different individuals and also in the same individual, and it appears that the bactericidal properties are influenced by this variation.

We have done a small series of experiments to test the efficiency of the drug in controlling pneumococcus infection in mice. While the results are encouraging we, as yet, have no definite conclusions to present.

In view of these and other experiments, the drug is now being given to patients suffering from various infections—pneumonia, typhoid fever and septicæmias in general. Necessary details as to the size of dose, frequency of administration, etc., are being studied.

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Case Reports

A CASE OF PERSISTENT CYST OF POST-ANAL GUT ORIGIN IN AN ADULT

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While sacrococcygeal tumours are not unusual, that group developing anterior to the sacrum is of uncommon occurrence in the infant and, because of the hazards associated, is unusually rare in the adult.

Personal history. — Miss R., white, retired, aged 67, was admitted to the Vancouver General Hospital on March 5, 1934, complaining of a foul chronic discharge from an opening at the base of her spine. She stated that she was born with a collapsed, empty, sac-like mass attached to the lower part of her back, which her mother told her was almost as large as the patient herself. At six months this sac began to fill with some fluid which gave the coverings a bluish colour, and gradually solidified, until at the age of one year, there was a solid mass suspended at the lower part of the back. The family physician felt she would not survive.

At three years disturbances of ocular control, in the nature of a squint, were noticed. At ten years the mass became very troublesome by reason of its weight. The patient walked at a normal time, but later, if she played strenuously, lumps would appear in the groins anteriorly. These disappeared on lying down. The mass was carried firmly bound to the body by straps. Dresses were made to order and attendance at school made possible. The mass at this time was about 8 inches long, attached from side to side across the posterior of the pelvis by a 4 inch stalk in a pendulous manner. It was now covered by skin. As long as the patient can remember, a clear odourless fluid was discharged from two small openings under the left border.

She was forced to have an operation at 27

years of age on account of severe headaches and excruciating pains in the tumour attachment. Moreover, for six months the mass had ulcerated on its upper surface in the midline, and discharged more or less continuously a black foul material. At operation, a 4½ pound tumour was removed and found to contain a reddish, clay-like material. The headaches were increased in severity for a time, then disappeared entirely.

The operative wound became the site of a sinus which has discharged ever since. It has been the field of at least three curative operations with no effect. For years a rubber tube was worn in the sinus until two became lost inside, requiring operative removal. There have been occasions when obstruction with chills and temperature occurred which were relieved by securing drainage. The discharge has varied from a clear to a yellowish colour and has soiled from one to four pads daily. Menstrual periods have occurred regularly, beginning at 15 and ceasing at 50. The patient has been self-supporting and, though retired, is still able to manage a house and garden.

Family history.—One sister was born with imperforate anus, and one brother died shortly after birth from some nervous ailment.

Physical examination.—The other regions of the body were essentially negative on examination. Vision was good, with no noticeable squint. The spinal column showed a thoracic prominence with round shoulders. There was a compensatory lordosis in the lumbar region, with the caudal end swinging posteriorly into a shelf-life projection. No coccyx was palpable. At the normal site of the sacrococcygeal joint there was a sinus opening, one-eighth of an inch in diameter. Pelvic measurements were normal. No evidence of involvement of the nervous system was found in the lower extremities.

Radiological investigation showed the absence of the terminal segment of the sacrum and the whole of the coccyx, which were represented by an irregular mass of bone projecting from the dorsal aspect of the extremity of the curtailed sacrum. A sinus tract about four inches long led into a dilated blind sac, curving back to the left and downward in the manner of a shepherd's crook. The anterior aspect of the sinus was situated very close to the posterior surface of the rectum, diminishing its calibre and displacing it forwards.

Treatment and course. — The patient complained so bitterly of the foul-smelling discharge that it was decided to explore by operation and attempt removal of the lining membrane, or at least to secure dependent drainage. On March 10th an incision through the wall of the sinus was made by Dr. W. L. Pedlow down to the dilated end, giving good exposure. Three sphincter-like constrictions of the sinus wall were encountered at one inch, two and three inches respectively. The lining of the sac consisted of a firm glistening membrane, one-eighth to one-quarter inch thick. The terminal wall lay against, or was formed by, the posterior wall of the rectum. Here it was a salmon-pink in colour and appeared to be a secreting membrane. Masses of greyish, hard cartilaginous and mucoid material were removed from the tract. An attempt was made to destroy the lining of the cavity with carbolic acid. Mercurochrome packing was inserted and a good opening left for drainage.

FIG. 1.—X-ray of the cyst injected with barium through a catheter lying in the sinus.

FIG. 2.—Section through mucoid contents of cyst, showing definite gland lined by columnar epithelium of mucous type. (Low power).

For six weeks daily irrigations were done with boracic, and attempts made at stimulating granulations with silver nitrate. It was found that the area near the rectum would not granulate, and the prognosis was considered unfavourable. In view of the age and condition of the patient, a more radical operation was not agreed upon, and she was allowed to go home with a persisting sinus but practically no discharge.

Pathological examination. — Macroscopically the specimens removed showed spicules of bone and small cyst-like spaces filled with a ropy mucous material. Microscopically, a rather heterogeneous type of structure presented. Spicules of well-formed bone were embedded in a fibrous and myxomatous stroma with occasional muscle fibres. In some places many cystically-dilated gland formations occurred, lined by cuboidal epithelium and tall ciliated epithelium. Epithelium showing excessive mucus-production was also seen and goblet cells suggested. Small numbers of ganglion-like cells were scattered here and there in loosely arranged glial tissues. No evidence of malignant change was noted.

COMMENT

Ventral tumours of the sacrococcygeal region occur as rarely as 1 in 34,582 among tumours found in the newborn.[2] They are very prone to malignant changes, and the child does not usually survive the first year. Embryologically, such tumours develop from the neurenteric canal remnant or the post-anal gut,[1] more commonly the latter.[2] Post-anal gut tumours lie between the rectum and the coccyx, frequently displacing pelvic organs anteriorly. They are observed at birth as papillary external tumours extending upward behind the rectum and occasionally outward over the vertebral column.[1] Thompson reports[2] that sinus formation, secondary infection, multiple operations and malignant degeneration are common to this condition.

SUMMARY

A case of ventral sacrococcygeal tumour is reported with history. The radiological, operative and pathological findings are described.

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A CASE OF LINDAU'S DISEASE

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Mrs. M., aged 39 years, married, without previous complaints, was admitted to the Indoor Service of the Hamilton General Hospital on November 8, 1931, complaining of severe occipital headaches of seven weeks' duration. On examination, diminished vision, with hypermetropia, was found in both eyes. The right fundus showed a curious area of hæmorrhage about the disc. She was slightly unsteady on standing, and had diminished reflexes, but coordinated well. Blood urea nitrogen was 14.25; creatinin 0.895; sugar 0.092; calcium 9.0; blood pressure, 170 systolic, 110 diastolic. Spinal puncture produced clear fluid without increase in pressure. The urine (catheterized specimen) showed many leucocytes, but no albumin or other abnormal findings. Suppression of urine came on during her time in the hospital, so that on the ninth day 115 c.c. was the total output. She vomited occasionally from the time of admission, and more frequently after the seventh day. On the tenth day, she submitted to a phenolsulphonephthalein test in the morning, and in the first hour excreted 30 per cent of the dye. About an hour later she suddenly collapsed and died within a few minutes. The tentative diagnosis was chronic nephritis, in spite of the lack of confirmation from the laboratory.

The post-mortem examination, conducted on the day of death, revealed an extraordinary condition. The brain was somewhat œdematous. A clear glistening cyst was visible on the medial side of the right cerebellar lobe. After fixation, the cyst was opened and proved to be ovoid in shape, measuring about 3 by 2 by 2 cm., occupying the greater part of the lobe of the cerebellum, though only a small segment was visible from the surface. The cyst contained a quantity of clear yellow fluid and a small tumour, measuring 2 by 1 by 1.5 cm., the size and shape of an almond, and attached to the cyst on one side. The cyst wall was smooth and pale in colour. The tumour itself was firm and somewhat fleshy in consistency. On opening the left lobe of the cerebellum in the coronal plane a small bright

yellow tumour similar in appearance to the former was found in the region of the dentate nucleus. This was also partially surrounded by a narrow cystic space.

The abdomen also held findings of interest. The pancreas contained a large number of cysts, up to 1 cm. in diameter, filled with clear serous fluid. The kidneys were of normal size and contained both on their surfaces and in the cortex a number of cysts measuring up to 7 mm. in diameter. At the upper pole of the right kidney was a greyish tumour, conical in shape and spongy in consistency, and measuring 1.5 cm. in diameter. The ovaries also were cystic. Microscopically, the tumours in the cerebellum consisted of hæmangioblastomas, as Cushing and Bailey apply the term. The structure was chiefly a mixture of cellular mesodermal tissue and capillary network with a few larger vessels or sinuses. The capillaries were well formed and contained small masses of blood cells, but were for the most part empty. There was no definite capsule, the border of the tumour invading the nervous tissue with its young vessels. The pancreas was densely fibrosed, the lobules of pancreatic tissue being surrounded and infiltrated with fibrous tissue. Within the fibrous tissue a large number of cysts was present. The smaller cysts were in groups and were lined by a single layer of low columnar epithelium, while the larger ones were lined by heaped-up columnar epithelium. The cysts of the kidney contained granular débris and were surrounded by fibrous walls, lined with low columnar epithelium. The renal tumour was a papillary adenoma showing simple acini lined with small cuboidal cells, with papillary ingrowths in the acini. This type of adenoma is described by Karsner as of embryonal derivation.

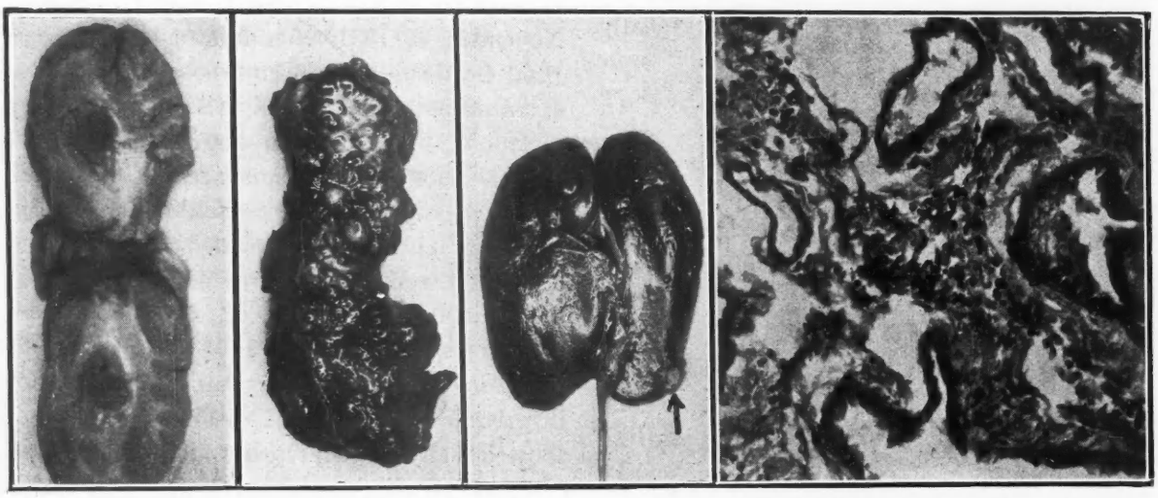


FIG. 1.—Cerebellum in section showing tumour.

FIG. 2.—Gross appearance of pancreas at autopsy.

FIG. 3. — Kidney showing adenoma.

FIG. 4.—Microscopic section of cerebellar tumour showing sinuses and cellular structure.

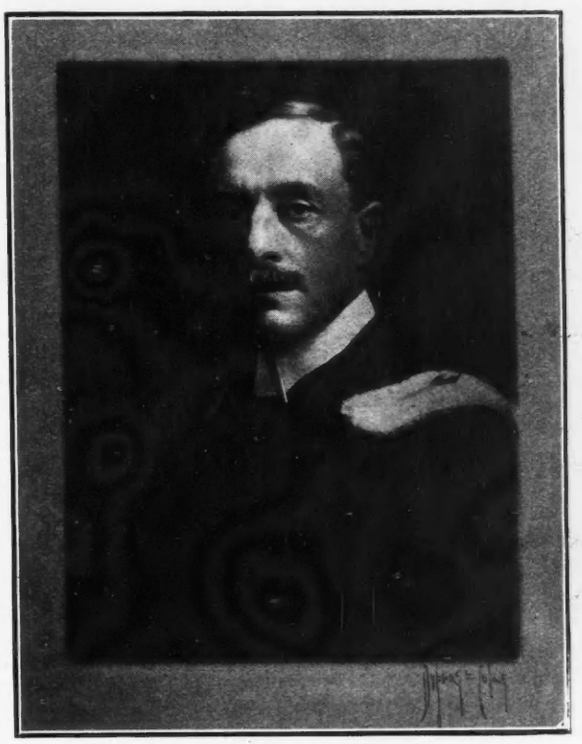
These findings are sufficient to determine a diagnosis of Lindau's disease, as described in 1926 by Arvid Lindau. The typical picture of this syndrome consists of a cerebellar hæmangioma usually associated with a cystic condition of the pancreas, kidney, and, occasionally, of other organs. In a fair number of cases a retinal hæmangioma has been present, where it was sought. This optical finding provides the chief clue in the few cases which have been diagnosed prior to operation or autopsy. The symptoms are those of cerebellar tumour. Surgical intervention has been successful in a few cases, but the case mortality of 36.4 per cent in Cushing's series indicates the gravity of the condition. The average age of the patients was 34 years, this being somewhat higher than the age for glioma.

Men and Books

THE LATE LOUIS DE LOTBINIÈRE HARWOOD

The recent death of Dr. Louis de Lotbinière Harwood, Dean of the Medical Faculty of the University of Montreal, calls for more than a casual notice. Gifted with great executive ability, a nimble mind, tact and unusual charm of manner, he would seem to have been destined for preeminence in any station that he would be called upon to occupy. His success and the esteem in which he was generally held bears witness to the truth of this estimate of his character.

Doctor Harwood represented in himself two nationalities. On the Lotbinière side he was French; on the Harwood side, he was English, descended from a sturdy Yorkshire stock, and, as our contemporary, *L'Union Médicale du Canada*, so well expresses it, (1934, **63:** 523) he united in his own person the charm and qualities that are found in both countries—the brightness, the propriety and the elegance of France, the progressiveness and steadiness of England. It is in the light of this dual nature, the elements of which are to some extent opposed, to some extent complementary, that we can best explain the qualities and certain contradictions in the character of Doctor Harwood.



Louis de Lotbinière Harwood

There is much of interest connected with the Lotbinière family that deserves to be kept on record. For the genealogical details that follow now we are indebted to the courtesy of the editors of *L'Union Médicale du Canada*.

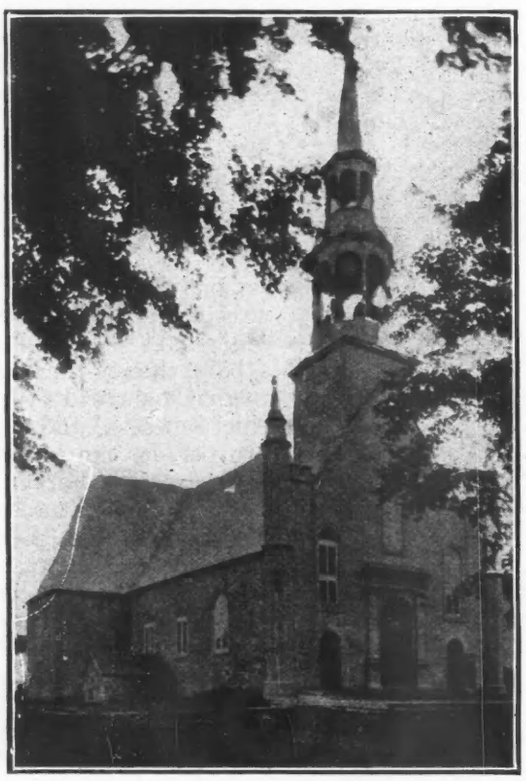
"The family of Chartier de Lotbinière is of the old noblesse. Every one knows the pretty legend of the queen of Scotland who gave a kiss of admiration to the sleeping poet, Alain Chartier. Father Lejeune, of Ottawa, in his Historical Dictionary, relates how, about the middle of the fifteenth century (1456), Clement Chartier, the owner of Binière, who was fond of a certain fish which he had introduced into the moat of his castle, added its name (lot) to that of his land, to distinguish it from another of his possessions called Bignière. Thus, when ennobled by the king, the family became Chartier de Lotbinière. Perhaps this is a legend also. But this much is certain. There was at the court of Louis XIII a René Chartier de Lotbinière, an eminent physician and learned scholar, in favour with the King and with Richelieu, but who was attacked by Guy Patin because he defended the use of antimony in defiance of the edict of the Faculty. This spectacle of a dean of the Faculty of Paris persecuting one of the Lotbinières strikes us as somewhat "piquant", and serves to remind us that much water has flowed under the bridges of Paris and down the St. Lawrence since that time.

The two sons of René Chartier de Lotbinière came to Canada at the beginning of the seventeenth century, the second, to remain here. The eldest was also called René; he was in 1643 the second chaplain of the Ursulines at Quebec. He was a lover of fine furs, and accordingly got into difficulties with the Company of the Hundred Associates, going back to France in 1647. His brother, Louis Théandre de Lotbinière, landed at Quebec in 1651 with M. de Lauzon. He was the founder of the Canadian family of Lotbinière. Procurer-general of the seneschal's department (1652), then of the Sovereign Council (1664) chief seneschal and chief provost, he can be considered as the Father of the French-Canadian Magistracy (de Léry-Macdonald). It was he who gave the first ball at Quebec, to the great scandal of the Jesuits of that time. From the heights of the paradise of honest people this good man should be able to look with genial satisfaction upon the worldly success of his descendants.

Michel, the grandson of Louis Théandre de Lotbinière, the only Canadian created a marquis by Louis XIV, married Louise Madeleine Chaussegros de Léry. He was an engineer like his grandfather. He was one of the architects of the victory at Carillon. His part in the history of Canada is very little known, but would seem to have been of more importance than has been thought. He left only one son, Alain Chartier de Lotbinière who, in turn, left only three daughters. Thus it came about that to the two silver partridges on the golden fir trunk in the family coat of arms were added the three symbolical distaffs. The eldest daughter, Louise Josephte, married Colonel Robert Unwin Harwood in

1823. From this marriage sprang Henry S. Harwood, the father of Louis de Lotbinière Harwood. Henry S. Harwood married an English woman, Miss Brauneis. Alain Chartier de Lotbinière had, also, married a Munro. English blood had thus been in the family for three generations when Doctor Harwood was born in 1866."

Our esteemed contemporary sums up Doctor Harwood's achievements as follows. "A charming man, never reading, in no way devoted to letters, he yet possessed an untiring activity, a great ambition, a talent for action and government which made him a remarkable dean. One need not look for his writings; he wrote little. One need not analyse his teaching; he made



The Church of Saint-Michel-de-Vaudreuil

scarcely more of this. But, with the help of his friends, he reorganized the Faculty of Medicine, accomplished the reconstruction of the Notre-Dame Hospital; and in the direction of the University of Montreal he took a leading part."

On the south side of the Ottawa river, some thirty miles from Montreal, lies the little village of Vaudreuil, in a locality closely associated with the fortunes of the Lotbinière and Harwood families. The parish dates back to 1773, and the church, somewhat altered, as usual, was constructed about 1787. The visitor to Vaudreuil will find much to interest him. The high altar of the church of Saint-Michel-de-Vaudreuil is said to be the handiwork of the celebrated wood-carver Louis Quevillon, of Saint Vincent de Paul, near Montreal, from whose atelier emanated much work of a high order of excellence. A chapel on the right is dedicated to Saint Louis, King of France, and on the wall is a large picture representing that pious king at prayer. On the wall opposite the altar are four tablets with the following inscriptions, which are illuminating:

CY GIT

DAME MARIE JOSEPH GODEFROY DE TONNANCOUR
ÉPOUSE DE L'HONORABLE M.E.G.A. CHARTIER DE LOTBINIÈRE
ECUIER M.C.L. & SEIGR. DE LOTBINIÈRE, VAUDREUIL & RIGAUT
NÉE AUX TROIS-RIVIÈRES LE 3 9BRE 1742
DÉCÉDÉE A VAUDREUIL LE 28 JUILLET 1799
CETTE MÈRE DES PAUVRES SUT REUNIR
ET FAIRE AIMER TOUTES LES VERTUS
PLEUREZ SUR SA TOMBE
HONOREZ SA MÉMOIRE
PRIEZ DIEU POUR ELLE.

IN MEMORIAM
MICHEL EUSTACHE
GASPARD CHARTIER DE LOTBINIÈRE
CHEVALIER DE ST-LOUIS, MARQUIS DE LOTBINIÈRE
NÉ EN 1723, MORT Á NEW-YORK 1799
EUSTACHE GASPARD
MICHEL ALAIN CHARTIER DE LOTBINIÈRE
MARQUIS DE LOTBINIÈRE
SEIGNEUR DE VAUDREUIL, RIGUAD ET LOTBINIÈRE
ORATEUR DE LA CHAMBRE D'ASSEMBLÉE Á
QUEBEC EN 1793, MORT EN 1821,
DAME CORNÉLIE MUNRO
SON ÉPOUSE, MORTE EN 1834.
DAME MARIE LOUISE
JOSEPHTE DE LOTBINIÈRE
SEIGNEURESSE DE VAUDREUIL, VEUVE DE
L'HON. ROBERT UNWIN HARWOOD,
CONSEILLER LEGISLATIF &C, NÉE LE 14 DECEMBRE 1803
MORTE Á VAUDREUIL, 6 OCT. 1869
VIVEMENT RÉGRETTÉE DES PAUVRES ET DES SIENS
REQUIESCANT IN PACE

CI GIT
DAME LOUISE MADELEINE
CHAUSSE-GROS DE LÉRY
ÉPOUSE DE MICHEL CHARTIER CHEV'R
SEIGNEUR DE LOTBINIÈRE
LIEUT. COLONEL DES INGENIEURS ROYAUX
CHEVALIER DE ST-LOUIS
ET SGR DE BEAUHARNOIS, HOCQUART, ALLAINVILLE,
NÉE A QUEBEC LE 7 JUIN 1726
DÉCÉDÉE Á VAUDREUIL, LE 1ER D'AVRIL 1807
PRIEZ POUR ELLE.

LA FEMME SAGE RELÈVE LA MAISON: PROV, 14.
ELLE OUVRE SA MAIN A L'INDIGENT
ET TEND LES BRAS AU PAUVRE, PROV. 31
LA FORCE ET LA DIGNITÉ FONT SA PARURE

ON AMASSE DES BENEDICTIONS QUAND ON
HONORE AINSI SA MÈRE. ECCLÉ. C.3.V.5.

ICI REPOSENT
ANTOINE CHARTIER
DE LOTBINIÈRE HARWOOD
SEIGNEUR DE VAUDREUIL & CAVAGNAL
LT. COL. DE MILICE
DEPUTÉ-ADJUDANT-GÉNÉRAL
DU 6ÈME DISTRICT MILITAIRE
ANCIEN REPRESENTANT DE VAUDREUIL
NÈ LE 23 AVRIL 1825
DÉCÉDÉ LE 26 AOUT 1891
SON ÉPOUSE
JOSEPHINE MARGUERITE ANGÉLIQUE
LE FEVRE DE BELLEFEUILLE
SEIGNEURESSE DE MILLE ISLES
ET DE L'AUGMENTATION
NÉE LE 26 OCTOBRE 1824
DÉCÉDÉE LE 17 SEPTEMBRE 1916
R.I.P.
DOMINUS MIHI ADJUTOR

Close by the chapel of Saint Louis is the seignorial pew, ornamented with the armorial bearings of the Chartier de Lotbinière family. Near the chapel on the left is a tablet dedicated to the memory of Dame Henri-Elzear Taschereau, née Marie Antoinette de Lotbinière Harwood. The inscription runs:

Á MA MÉRE
MARIE-ANTOINETTE HARWOOD
DÉCÉDÉE 2 JUIN 1896
ELZÉAR-R. A. TASCHEREAU

The Harwood Manor House at Vaudreuil was built sometime before 1850 by Robert William Harwood, son of Robert Unwin Harwood, above mentioned. Mr. R. W. Harwood, who was co-seigneur of Vaudreuil, married Mary Charlotte McGillis, whose father was a lawyer and heir to his uncle, Hugh McGillis, one of the partners in the famous North-West Company. The house no longer belongs to the Harwood family.

The passing of a distinguished son of a distinguished family has thus enabled us to take a peep at the romantic past and the days of "The Old Régime" in New France, that period so replete with legend, story, and high endeavour.

A. G. NICHOLLS.

Clinical and Laboratory Notes

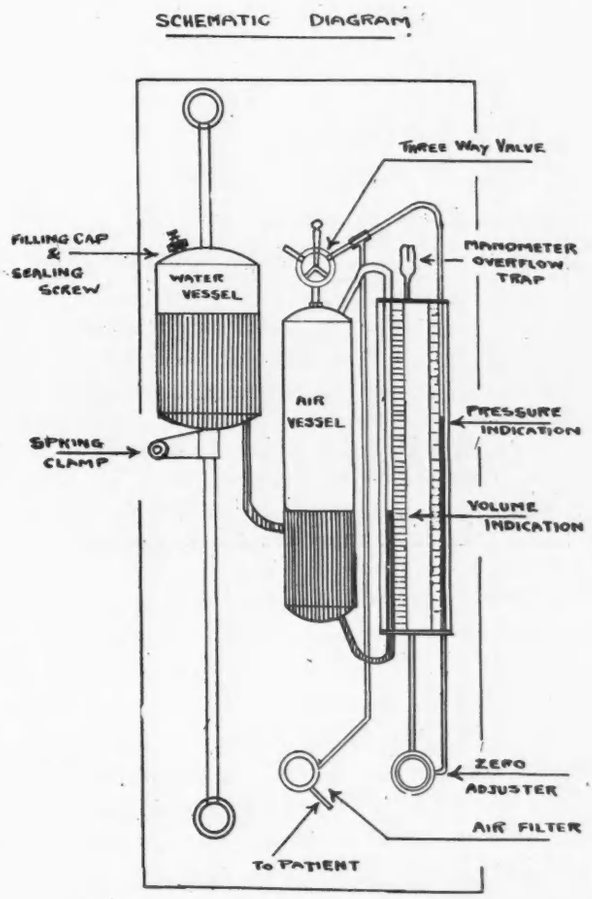
AN IMPROVED PNEUMOTHORAX APPARATUS

BY W. H. HATFIELD, M.B. AND W. K. TREMBLE,

Vancouver

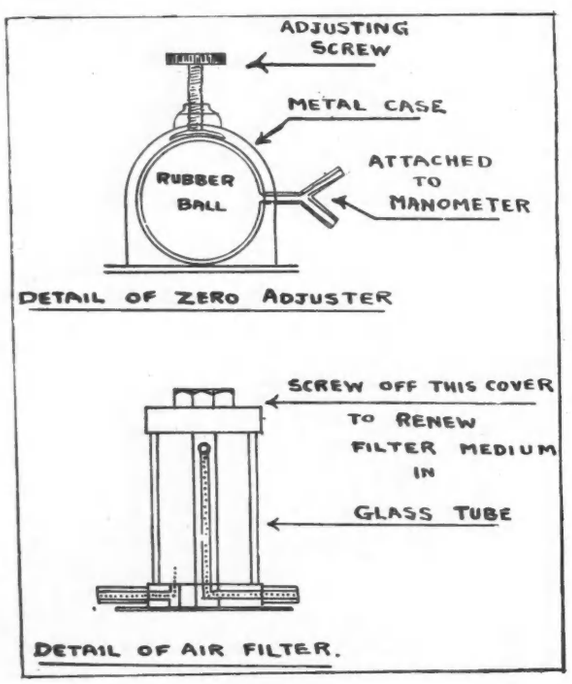
Collapse therapy has undoubtedly become the most important form of treatment in pulmonary tuberculosis today, and the method of application in the vast majority of cases is by the introduction of air into the pleural cavity. It is probably safe to say that pneumothorax is applicable in at least 50 per cent of cases of pulmonary tuberculosis. This percentage will undoubtedly vary with the efficacy of the preventive system in force in any given community, for such will usually determine the stage at which the disease is found. The Vancouver Public Health Institute for Diseases of the Chest, comprising both in- and out-patient departments, has afforded extensive experience in the administration of this treatment, with the result that we have become increasingly enthusiastic in its application.

Due to the number of pneumothoraces given daily, we became impressed with the crudeness of the apparatus in use, and have endeavoured to devise some means by which the treatment could be given more efficiently and with greater simplicity. The apparatus herein described has been found to meet our requirements admirably, and is an improvement on the usual type of equipment used for this work. The method previously in use presented certain difficulties, such as: (1) awkwardness in creating pressure, either positive or negative; (2) frequent leakages through rubber connections; (3) too many valves or clips; (4) a slow and awkward process of recharging; (5) crude volume reading; (6) lack of a standardized reading manometer; (7) difficulty in always having the manometer initially at the zero level; (8) fluid being forced from the manometer due to coughing; (9) lack of uniform flow of air during administration.



We believe that the apparatus herein described corrects the above-mentioned difficulties and that it greatly simplifies the procedure. The device may also be made portable and may be easily manipulated by the operator without assistance.

The apparatus is comprised of two monel metal closed cylinders, one being mounted on a board and the other being arranged to slide freely on a steel rod. There is but one easily manipulated valve; this and the water vessel being the only moving parts of the equipment. Volume and pressure readings are clearly visible, the volume gauge and pressure manometer being mounted directly on an ivorine plate, upon which are inscribed appropriate graduations.


ADJUSTING SCREW
METAL CASE
ATTACHED TO MANOMETER
RUBBER BALL
DETAIL OF ZERO ADJUSTER
SCREW OFF THIS COVER TO RENEW FILTER MEDIUM IN GLASS TUBE
DETAIL OF AIR FILTER.

The air filter and zero adjuster will be seen near the base of the apparatus.

In the schematic diagram the water vessel will be seen to be shorter and wider than the air vessel; this arrangement permits of either positive or negative pressures being rapidly established as required. A self-charged syphoning system is employed, which considerably shortens the rubber-tube connections between the two vessels. The spring retaining clip of simple design permits the water vessel to be easily lowered or raised, thus varying the air pressure instantly as desired. The filling cap, placed at the top of the water vessel, is fitted with a screw for sealing against leaks during transportation. The relatively long and narrow air vessel with its attached air-volume gauge permits of accurate readings as low as 10 to 12 c.c. of air. One limb of the manometer, being concealed, minimizes the possibility of errors in reading the indications of the other visible limb, whose scale is clearly graduated at 1 c.m. intervals (vertical height of water).

The machine is capable of delivering up to 1,200 c.c. of air at negative or positive pressure, ranging from 0 to 35 c.m. respectively; by simply raising or lowering the water vessel the pressure is varied as required.

Mounted at the top of the posterior concealed limb of the manometer is a small glass receptacle which traps the manometer fluid when coughing occurs, the fluid returning automatically to the manometer. The possibility of air leakage is reduced to a minimum by the general design of the machine and the few rubber connections used in its construction.

The one valve, as will be noted in the diagram, performs the several requisite functions. In three definite positions of the handle the valve is closed. Three other definite positions operate the valve as follows: (1) to open the air vessel to the atmosphere, to charge the same; (2) to open the manometer to the atmosphere, to check zero; (3) to connect the patient to both manometer and air vessel simultaneously. Details of the simple air filter and zero adjuster may be seen in the two separate diagrams. The latter fitting allows of the manometer zero being accurately adjusted by means of a set screw, as may be required from time to time, without adding to the fluid within the manometer. A small rubber ball, filled with fluid and connected to the base of the manometer, serves as a reservoir, which, when compressed or relaxed by means of a screw adjustment, raises or lowers the manometer liquid to the exact zero level.

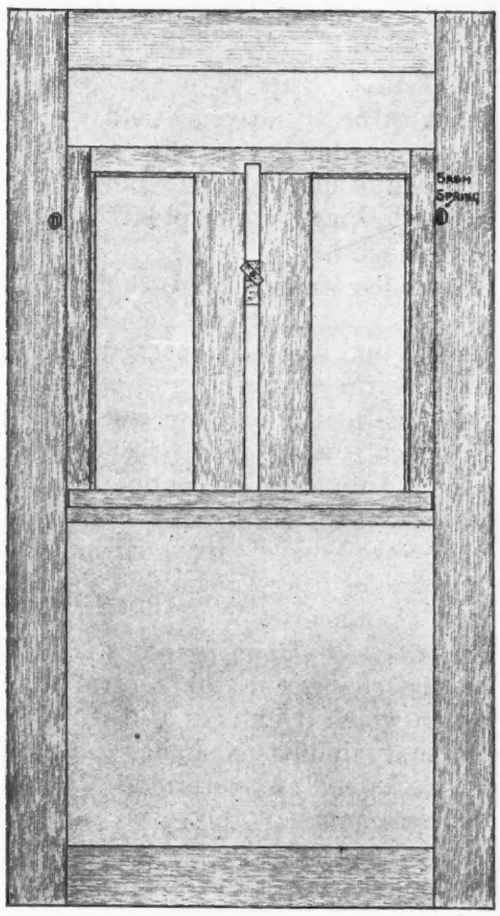
This apparatus is offered as a simplified method of administering pneumothorax, and has proved of distinct value in our institution. It permits of rapid recharging and the instantaneous creation of positive or negative pressure, allowing a large number of pneumothoraces to be effected in the minimum of time, if necessary without assistance. The cylinders and other fittings are readily removable for cleaning; there is but slight risk of breakage of any portion of the machine; straight lengths of glass tubing only being used, breakages are easily replaced. Sturdiness and rigidity are features of design, and the simplicity of arrangement may be noted in the pictures. The apparatus may be used either as a wall model or is easily portable. A period of 20 or 30 seconds only is required, during which time this machine may be completely charged and set ready for use, the operator's left hand only being necessary for its operation.

A SIMPLE UPRIGHT CASETTE HOLDER

BY J. H. WESLEY,

Newmarket, Ont.

Attached to the wall in my radiographic room, where every available inch of space counts, there is an adjustable upright casette holder.



It is a model of simplicity, convenience and cheapness.

It consists of a wooden frame in the office finish, and resembles a window frame with a moveable half sash. The size is 28 by 52 inches high, or varied to accommodate the range of the x-ray tube. Similarly its place of attachment to the wall is where it can be most easily reached by the tube, whether the tube is on a stand or attached to the rail of a table.

The face of the frame is 3½ inches wide and 1¼ inch thick and the inside edge contains a slot 1 inch wide and ⅜ inch deep, in which slides up and down, another frame or "open window frame", which is 1½ inch wide and 1 inch thick. This window sash is open at the back, excepting for two wooden strips, each 3 inches wide and ¼ inch thick, attached to the back of the frame and separated by a ⅝ inch space in which a button or beak comes down over the edge of the screen to keep it from falling forward; and, similarly, a ledge or strip of wood attached to the lower part of the frame prevents the screen from sliding forward. This inner frame is made large enough to hold any size of screen, from 8 by 10 inches to 14 by 17 inches, and counterbalanced by sash springs of the proper strength so that the frame containing the loaded screen of any size will remain at any desired position by reason of the springs.

THE DETERMINATION OF BLOOD CHOLESTEROL

J. Kemlet has devised a rapid method of determining cholesterol in whole blood, serum, or plasma. In this technique 0.2 c.c. of blood (whole, plasma, or serum) is deposited and allowed to dry on an ashless 7 cm. filter paper; when dry the filter paper is extracted with 10 c.cm. of chloroform for two hours. This solution is compared colorimetrically with a standard cholesterol solution by the Liebermann-Burchard reaction. An accuracy of 9 mg. per 100 c.cm. is claimed. For routine laboratory methods this should prove invaluable, as it is simple and quick, and can easily be done in duplicate if greater than clinical accuracy is required.—*J. Labor. & Clin. Med.*, 1934, **19**: 883.

THE PRESCRIBING OF SECRET REMEDIES. — Special measures are essential with a view to eliminating the use of secret remedies, the consumption of which in the United States represents almost three times as much (360 million dollars) as the total sum (121 million dollars) at the disposal of public and private health organizations. The rules laid down in Germany by the Joint Medical and Health Insurance Committee of the Reich prohibit the prescription of secret remedies. What is chiefly required, however, is that the law should make licences to manufacture and sell medicaments subject to certain conditions relating to staff, equipment and operation; that it should require a clear and scientific statement of the nature and quantity of the active substances used in the preparation of medicaments and provide for the verification of such statements, and that it should make the analysis of certain medicaments compulsory; that it should render the manufacturer responsible for seeing that the declaration supplied corresponds to the actual composition of the preparation; that it should prohibit excessive or misleading publicity; and that it should specify the nature of the substances which may be sold by drug stores and pharmacies. Close cooperation between doctors and pharmacists is necessary with a view to securing to the public a rational supply of medicaments and to protecting sick persons and the community at large against exploitation of all kinds. Misleading publicity and the use of worthless medicaments may not merely involve a waste of money for the individual and the community, but may also indirectly injure health and even endanger life by leading the consumer to forsake reliable medicaments, and preventing recourse to medical advice at the proper time; similarly, quackery is doing serious harm both to natural economy and to the public health.—*Quart. Bull. Health Organization, League of Nations, Vol. II—7.*

Editorial

MARIJUANA

THE peculiar and striking effects of the hemp plant when taken as a drug into the human system have been known for many centuries. Indeed, it would appear that from time immemorial it has been used in several forms and by various methods for its stimulating and narcotic effects by many millions of people in the East. During the eleventh century a remarkable sect of unorthodox Mohammedans appeared in Asia and gradually established themselves as a considerable and dreaded military power. Their most famous leader was Sheik-al-Jebal, known to contemporary literature as "The Old Man of the Mountains", a functionary who gave much concern to the Crusaders. This sect is supposed to have attained its "bad eminence" through the violence and impetuosity of certain bands of its members while under the influence of hemp. The name given to it, "Hashishim", or "The Hemp People" is the origin of our word "assassin". Etymology sometimes conveys an interesting bit of history.

The plant concerned is known in the pharmacopœias as *Cannabis indica*, a variety of *Cannabis sativa*, belonging to the order Cannabinaceæ, in which there are only two species, the hemp and the hop. It is related to the nettle. It is a native of Persia and India, but is cultivated for its fibre in most warm, dry climates, as in Italy, Russia, South Africa, and in parts of America. It is not unknown in Canada.

The poisonous action of the plant is due to an active principle called "cannabinol," which is contained in a sticky resinous substance secreted chiefly by the female plants. The dried and compressed resinous tops are known in India as "ganjah" and, elsewhere, as "guaza". This product is smoked usually with tobacco. The dried leaves are called "bhang" in India and "hashish" in Arabia. From them can be made by infusion an intoxicating drink, or they may be made up into a conserve. Among the Persians, Arabs, and Egyptians hashish was used originally as a flavoured sweetmeat or treacle, prepared either from the leaves or the resin. Nowadays, hashish is more often smoked with tobacco. In South Africa the Hottentots smoke the drug under the name of "dakha" or "dagga." The resin separated from the plants is known in India as "charas" or "churras." This is obtained in some instances by the primitive method of walking, clad in a leathern garment, through the field of plants and later scraping the resin from the clothing, or the plants are beaten over rough cloths.

The peculiar properties of the hemp plant as effecting derangements of the central nervous system are most marked when it is grown in warm countries, and also seem to depend somewhat on climate and the season during which it is grown. Its effects, therefore, are not uniform and cannot always be predicted with certainty. The following excellent description of its pharmacological action is taken from Cushny's "Pharmacology and Therapeutics."*

"The effects of *Cannabis indica* are chiefly due to the changes in the central nervous system, in which it induces a mixture of depression and stimulation similar to that seen under small doses of morphine. Its action is much less constant, however, and seems to depend very largely on the disposition and intellectual activity of the individual. . . . . Soon after its administration the patient passes into a dreamy, semi-conscious state, in which the judgment seems to be lost, while the imagination is untrammeled by its usual restraints. The dreams assume the vividness of visions, are of boundless extravagance, and, of course, vary with the character and pursuits of the individual. . . . Ideas flash through the mind without apparent continuity, and all measurement of time and space is lost. True hallucinations may appear, but are often absent, the chief features of the actions being merriment, comfort, well-being, and self-satisfaction. Often, less pleasant thoughts obtrude themselves, however, such as the fear of impending death or of some imminent, indefinite danger.

* Ninth ed., Lea & Febiger, Phila., 1929, p. 281.

During this period the consciousness is not entirely lost, for the patient often feels that his dreams are unreal, his satisfaction unfounded, and his movements ridiculous, but he cannot restrain them; he can give a coherent account of his condition when aroused and answers questions intelligently. . . . . Later the dreams alternate with periods of complete unconsciousness from which the patient can be aroused easily, and the symptoms eventually pass into tranquil sleep, from which he awakens refreshed, and, as a rule, without any feeling of depression or nausea. . . . . In some cases acute mania and convulsive attacks have been developed, and among the natives of India catalepsy occasionally occurs."

It will be seen from this that the use of this drug must have a peculiar fascination for certain types of character. That there is no after-depression or nausea is an added attraction. The periods of excitation with loss of adequate control would seem to present special dangers. Probably, indulgence in Indian hemp is responsible for the curious case of Orientals "running amok", and the plausible suggestion has been brought forward that some of the many crimes of violence being perpetrated at the present time in the United States should be attributed to the same cause. It is a point that deserves investigation.

The interest for us in this matter lies in the fact that the use of Indian hemp is no longer confined to the "mystic East" but has become a real menace in Canada and the United States. At the last session of the Opium Advisory Committee of the League of Nations, held in June last, it was stated that "Seizures of Indian hemp have been reported from Canada, Egypt and Roumania. The Canadian seizures are of interest, as these appear to be the first seizures of hemp drugs introduced into Canada from places other than the American continent. The Committee will remember that previously there have been a number of seizures in Canada of marijuana cigarettes from the United States." The fact that various authorities have tightened the clamps on the manufacture of drugs such as opium, heroin and cocaine, and that their vigilance has made the illicit traffic in these drugs highly precarious, has caused the "dope" vendors and addicts to explore other fields, that promise similar profit and pleasure and less risk. Hence they have turned to hashish, known in this country by the Spanish name "marijuana" (pronounced "marihuana"), or, more colloquially, "hay" or "the weed." While the cultivation of Indian hemp appears to be forbidden in most European and near-Eastern countries, liberal supplies continue to be available for the illicit traffic. The ease with which the hemp plant can be cultivated in warm countries and the fact that it grows wild in so many places render the problem of controlling the traffic a most difficult one. Hemp, for example, is grown clandestinely in some of the Balkan states, in Syria, South Africa, and in south-western United States. Supplies have also, recently, been obtained from certain of the West Indies.

For our information in regard to the development of the illicit traffic in Indian hemp as it concerns Canada we are indebted to the Narcotics Division of the federal Department of Pensions and National Health, and particularly to Col. C. H. L. Sharman, to whom we desire here to extend our cordial thanks.

The first intimation that the drug was being introduced into this country was received in May, 1931, when it was discovered that marijuana cigarettes were being sold in Walkerville, Ont., at $1.00 each. A purchase was made and an analysis showed that the cigarette was composed entirely of Indian hemp. It was further learned that these cigarettes were being brought over from Detroit, Mich., and were being sold to young boys and girls. The plant was in some cases obtained in bulk and made up into cigarettes on the Canadian side. It was found possible to purchase 370 grains of the loose weed for $3.10. Analysis of the bulk marijuana referred to above showed a strength approximating in potency 116 per cent of the American standard in the P.X. for fluid extract of *Cannabis indica*. In April, 1932, it became known that marijuana cigarettes were being sold illicitly in Ottawa. This traffic was traced to its source in Windsor, and, shortly after, it was learned that some thirty young people in that city were addicted to marijuana. The cigarettes were being peddled in dance halls. Again

the source of supply was Detroit. In May, 1933, the marijuana cigarette had reached Montreal, apparently from New York, and was being used in cabarets and night clubs, and by October of the same year shipments were arriving from the West Indies, in particular, from Kingston, Jamaica, and again, from West Africa. In July, 1934, marijuana cigarettes were being sold in Toronto. It has been stated, on competent authority, that the use of marijuana is very popular on the Pacific coast. Thus, it can be seen that the traffic in Indian hemp has attained the proportions of an industry with widespread ramifications. The same statement applies to the United States. The Mexican representative on the Advisory Committee of the League of Nations was quoted in August, 1933, as saying that in recent years the use of Indian hemp had greatly increased in Mexico, the United States, and Canada.

From statements before us it would seem that the illicit traffic in marijuana cannot be readily controlled in the United States, for the reason that Indian hemp is not included among the narcotic drugs specified in the Harrison Act, and, this, of course, means that Canada must show correspondingly increased vigilance to prevent imports into this country. Fortunately, our Narcotics Act fully covers the matter. The above tale, though told only in outline, will sufficiently indicate the excellent work done by our Narcotics Division, with the efficient aid of the Royal Canadian Mounted Police, in laying bare the existence of this nefarious traffic. Much has been done already to dash the ardour of the traffickers, and some salutary punishments have been imposed by the courts. Probably, much more yet remains to be done, but there is no doubt that eventually the traffic will be still better controlled, and, we hope, ended. The menace is a serious one, for the experience of all countries is that the hashish habit has a special appeal to the young, not, necessarily, that they crave for the drug, at least at first, but they use it with the desire to appear "smart." Then, comes the urge for more, and a dangerous habit is created. It would appear, also, that most of those indulging in hashish represent new fields for exploitation, they not having been at any previous time addicts to morphine, heroin, or cocaine.

A.G.N.

MEDICAL ECONOMICS—A VEXED QUESTION IN AMERICAN MEDICAL AND HOSPITAL ORGANIZATIONS

MEDICAL and hospital organizations in the great republic to the south, although all actuated by the same lofty ideal of healing the sick, are finding it very difficult to agree on the *modus operandi*, and, inasmuch as many Canadians are members of these organizations, or realize the likely effect here of principles adopted by our neighbour, the development and crystallization of these studies and policies is being followed with considerable interest.

On June 10th of this year the American College of Surgeons issued a statement embodying six principles: its desire to cooperate in providing more adequate medical care; the duty of the medical profession to assume the leadership in this movement; encouragement to the trial of ethically controlled methods of practice designed to provide more adequate medical service to the whole community; that the care of the indigent sick should be a direct obligation upon the community and physicians should be remunerated for their care; that a coordinated public educational campaign regarding protective and curative medicine should be undertaken; and that "the periodic pre-payment plan providing for the costs of medical care of illness and injury of individuals and of families of moderate means offers a reasonable expectation of providing them with more effective methods of securing adequate medical service." A number of desirable features are then appended, such including free choice of physician and hospital, payment on a basis of service, and freedom from the intervention of commercial intermediary organizations operating for profit. It was suggested that plans for the payment of hospitalization alone, without provision for payment for medical service, might be considered as the first project to be considered.

Two days later the American Medical Association issued a ten-point statement affirming its principles on this subject. While these differed in various aspects from the six principles issued by the American College of Surgeons, they are not so diametrically opposed as some press reports would have the public believe. This impression was gained largely, perhaps, from the action of the judicial council of the American Medical Association in asking the regents of the American College of Surgeons, who are members of the A.M.A., to explain their action in endorsing the principles of group-hospitalization. The house of delegates also condemned "this apparent attempt of the board of regents of the American College of Surgeons to dominate and control the nature of medical practice." The principles of the American Medical Association include: all features of medical service in any method to be under the control of the medical profession; no third party to intervene in any medical relation; free choice of physician; preservation of the confidential relation between patient and family physician; all medical phases of all institutions involved in the medical service should be under professional control, it being understood that hospital service and medical service should be considered separately; however the cost of medical service may be distributed, the immediate cost should be borne by the patient able to pay at the time of service; no connection between cash benefits and medical service; all qualified physicians in any locality should be eligible for any form of medical service; systems for the relief of low-income classes should be limited strictly to those below the "comfort level" standard of incomes; no restriction on treatment not formulated and enforced by organized medicine.

The action of the American College of Surgeons followed recommendations made to it after eight months of study by its medical service board, and was to some extent a confirmation of the stand taken some time ago by the Council and trustees of the American Hospital Association, an organization embracing many of our leading Canadian hospitals, in endorsing the principle of carefully safeguarded group-hospitalization or the periodic-payment plan for hospital care.

The Catholic Hospital Association, also an international body, has been watching the economic developments with close interest, particularly as many of its hospitals in both Canada and the United States have participated in group-hospitalization plans for years. Officially, its viewpoint is very conservative. At this year's convention a resolution was passed deeming "a careful and cautious study of the methods of affording relief to the low-income classes as worthy of the fullest encouragement;" at the same time the Association "again repeats its warning . . . . against facile and ill-considered schemes which ignore acceptable basic principles." It also warns against those plans or systems through which "the commercial ambitions of individuals rather than the social and economic and hygienic good of national and other social groups are furthered."

These varying pronouncements upon current trends in medical and hospital economics are all fundamentally actuated by the one desire to give the patient the best possible service. Naturally, the different angles of viewpoint affect the attitude taken. With group hospitalization now in operation in some fifty centres, many on a city-wide scale, information is accumulating which would seem to more than justify the setting up of those plans which have been carefully worked out and controlled; moreover, many medical organizations have endorsed local group hospitalization developments. At the same time the economic pressure of to-day may lead many hospitals into injudicious and unsound ventures, and therefore it would seem advisable to make haste slowly. For this reason, if for no other, the warm discussion concerning the advantages or otherwise and the potentialities of group periodic payment for hospital care should result eventually in more satisfactory and better safeguarded developments than might otherwise be expected.

G. HARVEY AGNEW.

Editorial Comments

Reducing Maternal Mortality

We commend to the careful attention of our readers an important article by Dr. W. B. Hendry, Professor of Obstetrics and Gynæcology in the University of Toronto, on the subject of "Maternal Welfare". It can be found on page 516 of this issue of the *Journal*. While of late there are indications that the death rate among Canadian women from various conditions incident to child-birth has improved somewhat, yet the degree of this improvement is not such as to cause jubilation. In this particular Canada still lags considerably behind Great Britain, New Zealand, and the Scandinavian countries. As Doctor Hendry points out, three mothers die every day in Canada from puerperal conditions, or about twelve hundred per year. One dies every day from septicæmia, and one every day from toxæmia. Most of these deaths could and should be prevented. Doctor Hendry's article tells us how.

In the prevention of deaths from puerperal causes two parties are concerned—the general public, and the medical profession. Both require educating. The public must be taught that pre-natal instruction and pre-natal care are essential if childbearing is to be made safe; also, it must learn that self-induced labour, otherwise, abortion, is a highly dangerous procedure. For such instruction the public should consult the medical man. Medical men, on their part, if, at least, they are intending to practice midwifery, must fit themselves to give the necessary instruction to their clients and endeavour to ensure that supervision is adequate. This is of the first importance. Second in importance, though second only in time and not in degree, comes the conduct of the labour itself and the post-partum stage. Here, in particular, the obstetrician should search himself to see if his technique can be improved upon. The chief causes of death in childbirth are sepsis, toxæmia, hæmorrhage, and post-operative shock. Doctor Hendry points out again, what everyone by this time should realize, that puerperal septicæmia is most often due to *infection of the parturient woman from without*. This means, in practice, that all persons with indications of naso-pharyngeal or bronchial trouble should be rigidly excluded from the lying-in room. In fact, it would be even better *to exclude all persons except the necessary trained personnel.* Even the doctors and the nurses themselves should take rigid precautions to avoid carrying infection to the patient. Masks, worn over the mouth and nose by doctors, nurses and patients, are helpful in this particular, but it should be remembered that not all masks are effective. Unless properly designed and constructed they may prove a delusion and a snare. In a word, the lying-in room should be as completely controlled from the standpoint of avoiding sepsis as is the operating theatre in a modern hospital. All this is obvious and so commonplace that it may be regarded as platitudinous, yet the admonition cannot be too often repeated, or so it would seem. A final word is that doctors should be more particular to report their cases of puerperal septicæmia than they are at present. Puerperal septicæmia is a notifiable disease, but it is evident that a considerable proportion of the cases are not being recorded. Neglect in this matter is reprehensible.

A.G.N.

The Montreal Neurological Institute

The inauguration of the new Montreal Neurological Institute, an integral part of McGill University, on September 27th, opens a new chapter in the history of Canadian medicine, one so important, indeed, that it may not lightly be passed by. The building itself, handsome and well-planned, is situated in convenient proximity to the Medical School, the Royal Victoria Hospital, and the Pathological Institute. Its erection was made possible through the munificence of the Rockefeller Foundation, which contributed half the cost and a handsome endowment, and of certain citizens of Montreal well-known for their philanthropy, namely, Sir Herbert Holt, Mr. J. W. McConnell, Mr. Walter Stewart, and some anonymous donors. The appeal of the project was so great that the Government of the Province of Quebec and the City of Montreal, wisely and generously, have undertaken to provide annual subsidies for its upkeep. Much credit is also due to Dr. C. F. Martin, Dean of the Medical Faculty, McGill University, Dr. Wilder Penfield, Director of the Institute, and their able associates for the excellent use they have made of the resources at their disposal. The result is a building and equipment that is said by competent judges to be unsurpassed anywhere.

Some of the speakers at the opening ceremony felt constrained to remind their audience that persons counted for more than buildings, or, otherwise, that "Fine feathers do not always make fine birds". In this particular instance we feel that the admonition, while undoubtedly conveying an important truth, was not required. Already a capable and enthusiastic band of workers has collected around Doctor Penfield and we shall hear more from them. We look

with confidence to the establishment here of a centre which will radiate the power of science to all parts of our Dominion, and beyond.

The achievements in neuro-surgery are little short of marvellous. Operations that were only dreamed of less than ten years ago are nowadays almost commonplace, at least in the hands of Doctors Penfield and Cone. And yet Doctor Penfield said in his address at the opening of the Institute that we were only at the beginning in these things. What must we look forward to when so much has been accomplished in a few short years? Already relief has been brought to the mentally afflicted, the maimed have been made to walk, the hopeless have renewed hope. We are immeasurably uplifted by the thought that neuro-surgery looks forward to still greater triumphs. The Montreal Neurological Institute will undoubtedly play a great part in this development. Not only is it a hospital for the treatment of the neurologically sick, but it is a research centre, well equipped and complete, for the study of the abstruse problems that come up in connection with the deranged nervous system. It will attract from far and near many who are seeking to advance in neurology and neuro-surgery, and it will send out experts to other parts. More than all, humanity at large stands to benefit. The whole community, not only of the City of Montreal, the Province of Quebec, but also of the Dominion, is under a great debt to those whose generosity and splendid ideals of citizenship have made this noble undertaking possible.

A.G.N.

A Joint Meeting in Quebec City

A long-cherished dream has materialized. A joint meeting of l'Association des Médecins de Langue Française d'Europe and l'Association des Médecins de Langue Française de l'Amérique du Nord, took place in August last, at Quebec, from the 27th to the 30th.

The presentation of scientific works, the preparation of which necessitated close cooperation, permitted Canadian physicians to bring forward the results of their experience and to publish them alongside those attained by their French confrères. The main reports on "Les syndromes pancréatiques", "Le traitement chirurgical des pancréatites", "Les états hypoglycémiques", and "La pyrétothérapie", were a synthesis and a *mis au point* on each of these subjects. They will be for sometime, we believe, the authority to which one who is interested in these questions may turn. The numerous compliments paid the authors suffice to bring to light the high scientific value of the works presented.

Besides these main questions, clinical sessions in the hospitals attracted numerous congressists. There also, doctors of Europe worked with the hospital staffs to study and bring forward to their colleagues their experience on concrete cases. Sectional meetings, where research work and surgical techniques, illustrated by lantern slides and coloured cinematography, were not the least appreciated of the scientific papers, and a packed audience attended each meeting.

A brilliant success crowned the Thirty-third Congress of the French-speaking Doctors of Europe and the Nineteenth Congress of the French-speaking Doctors of North America. A registration not yet equalled (near the thousand mark), an abundance of research papers and of new ideas on particular subjects, testified to a marked interest in the French and foreign delegations.

The social functions were not less important. The Honourable, the Prime Minister, the Honourable, the Lieutenant-Governor of Quebec, and His Excellency the Governor-General of Canada had prepared receptions for the doctors and their wives.

The year 1934 will be epochal in the annals of l'Association des Médecins de Langue Française de l'Amérique du Nord. This Congress will have served to strengthen the links which unite us to French medical science; it will have served to create new friendship, and to make known, more particularly to France, the name of Quebec and the status of Canadian Medicine.

L. GÉRIN-LAJOIE

The Life of Dr. F. J. Shepherd

We hope to publish before long a review of Dr. W. B. Howell's life of the late Dr. F. J. Shepherd. We need not enlarge upon Dr. Howell's qualifications for such a biography. Suffice it to say that a worthy subject has received thoroughly satisfactory treatment. Dr. Shepherd fills a large place in Canadian medical history because he was a man of unusual character and abilities. Not to many in our profession is it given to be a surgeon of international repute, an anatomist of the first rank, and a dermatologist of authority. Add to this a culture wide and well laid and a discriminating taste in art as well as a fine gift of draughtmanship, and one realizes how many sides he had. Besides all this he was a link between the pre-Listerian era of surgery and modern practice, for he had been trained by men who operated in an atmosphere of concentrated infection (though they also operated with a speed and precision not now customary), and he lived to be chief surgeon for many years in one of the leading Canadian hospitals of the day, the Montreal General Hospital. He was also a very close friend of Osler's—one of the band who led the medical world in Montreal for so long.

This is Dr. Howell's subject, and he has dealt fairly with it—with his well known penetration and his equally well known and refreshing humour.

H.E.M.

Association Notes

Maternal Welfare

It being the desire of the Executive Committee and the Maternal Welfare Committee of our Association that more prominence be given to the subject of maternal welfare, for the information not only of the medical profession but also of the interested public, we are reprinting here the Report of the Committee on Maternal Welfare presented at the last Annual Meeting of the Association, held at Calgary, together with a letter from the Chairman read at the "Mothers' Day Conference" at Toronto on May 10, 1934. An important article by Dr. Hendry on the same topic is to be found in this issue on page 516.

REPORT OF THE COMMITTEE ON MATERNAL WELFARE

I have the honour to submit the following Report of the Committee on Maternal Welfare for the year 1933-1934.

Your committee feel that attempts made to educate the public as to the great importance of maternal care and its relation to national and personal prosperity and happiness have been so far only partly successful, and would ask the Association to make an effort to interest the profession and all Provincial and local medical societies in bringing before the public the principles of maternal care and maternal welfare. The large majority of our people do not yet appreciate the supreme importance of pre-natal care. They do not realize that one-third of our maternal mortality is due to the toxæmias and that most of the toxæmias may be prevented. Nor do they realize that one-third of our maternal mortality is due to puerperal septicæmia and that puerperal septicæmia is a preventable disease. We lose three Canadian mothers every day in the year. One mother dies every day from puerperal sepsis. One mother dies every day from the toxæmias of pregnancy. The majority of these lives, amounting to nearly 1,200 every year, could and should be saved.

Again your Committee would draw attention to the problem of providing medical service for our Outpost Homes, and that not only in the far west and the far north but in the older provinces where sparse settlement and difficulties deprive homes and families of medical care. Your committee would ask the Association to bring this problem not only to the attention of the provincial medical associations but to the attention of the Dominion Government and the Provincial Governments. It concerns them all. In the day of the airplane and the radio it should not be impossible to solve this problem.

Your committee would recommend for study the following reports: "A Five Year Survey of Maternal Mortality in Manitoba", by Drs. Jackson, Defries and Sellers, *Canad. Pub. Health J.*, March, 1934. "Maternal Mortality in New York City", edited by Geo. W. Kosmak.

All of which is respectfully submitted.

W. B. HENDRY,
Chairman.

Toronto, May 10, 1934.

To the "Mothers' Day" Conference:

I have been requested to convey to this meeting my attitude regarding the Maternal Welfare service as recommended by the Advisory Committee to the Board of Health on Maternal Welfare. It should be understood that I speak as the official representative of the Academy of Medicine on the Advisory Committee, and as Convenor of the Committee on Maternal Welfare of the Canadian Medical Association.

In my opinion, Toronto needs the Maternal Welfare Service as planned and submitted to the Toronto Board of Control by the Advisory Committee. From the medical standpoint, it is the best plan, under existing circumstances, for reducing our maternal death rate, which is higher than it should be. The plan is the result of two years of careful work on the part of forty professional people; twenty-seven doctors, ten nurses, three social workers, as well as representatives from women's organizations. As Chairman of the General Study Committee, I should like to give credit to these busy people who gave their time and efforts free and generously. We all did so because we were seized with the seriousness of the situation and earnestly desirous of bringing about some improvement.

It is not possible to prevent all maternal deaths. But it can be stated with confidence that 50 per cent of our maternal deaths today can be avoided. The Maternal Welfare Service, as planned by the Advisory Committee, aims to save this 50 per cent of the mothers who now die needlessly because of lack of preventive care. The Service will provide such preventive care.

The plan recommended by the Advisory Committee, and which has been in force off and on during

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The following are the statistics in Maternal Mortality as supplied by the Dominion Bureau of Statistics.

MATERNAL MORTALITY IN CANADA IN 1932 AND THE FIRST NINE MONTHS OF 1933

	1932			*1933* First Nine Months*		
	All puerperal cases	*Puerperal septicæmia*	*Other puerperal causes*	*All puerperal causes*	*Puerperal septicæmia*	*Other puerperal causes*
Number of deaths:						
Canada	1,181	413	768	837	279	558
Prince Edward Island	13	6	7	6	2	4
Nova Scotia	53	14	39	38	16	22
New Brunswick	63	17	46	47	10	37
Quebec	421	172	249	293	95	198
Ontario	343	94	249	265	97	168
Manitoba	68	29	39	38	13	25
Saskatchewan	102	35	67	65	16	49
Alberta	64	30	34	55	18	37
British Columbia	54	16	38	30	12	18
Rate per 1,000 live births:						
Canada	5.0	1.8	3.3	4.9	1.6	3.3
Prince Edward Island	6.4	3.0	3.5	4.0	1.3	2.7
Nova Scotia	4.6	1.2	3.4	4.4	1.9	2.6
New Brunswick	5.8	1.6	4.3	6.1	1.3	4.8
Quebec	5.1	2.1	3.0	5.0	1.6	3.4
Ontario	5.1	1.4	3.7	5.4	2.0	3.4
Manitoba	4.8	2.1	2.8	3.7	1.3	2.4
Saskatchewan	4.9	1.7	3.2	4.2	1.0	3.2
Alberta	3.8	1.8	2.0	4.7	1.5	3.2
British Columbia	5.3	1.6	3.7	4.2	1.7	2.5

*Preliminary figures.

the past eight or nine months, insists upon the mother having carefully supervised pre-natal, delivery and post-natal care. It provides her with a supervised doctor and nurse. It provides a controlled means of educating the doctor, mother, and public in the essentials of maternal care. It is this combination and the safeguarding of standards of medical and nursing care which can effect a reduction in the maternal death and morbidity rates. This is what the doctors, nurses, social workers, and, of course, the citizens, want to see accomplished. There has been no dissension in the Committee about this plan. From a financial standpoint it is also very satisfactory. It will cost the city less to have a mother cared for in this safeguarded manner at home than it now has to pay for her in a public ward in hospital.

In the medical and nursing opinion, no other plan will serve. The Advisory Committee is agreed on this also. In our opinion the maternity service provided in the emergency Unemployment Medical Relief scheme cannot substitute for our plan. The Unemployment Maternity Service has no regulations as to standards. It makes no provision for pre-natal and post-natal care; there is no supervision of doctors; there is no provision for education. The Unemployment Medical Service is an emergency measure, for the unemployed only. Child-birth should not be treated on an emergency basis, and certainly it is not an unemployment problem. It is a general public health problem. Therefore, we cannot endorse this latter service as a measure for maternal welfare in Toronto.

Permit me to congratulate the organizations that have called this meeting, which is very timely, and should help in educating the public on this important matter.

Sincerely yours,

W. B. HENDRY, M.D., F.R.C.S.,
Professor of Obstetrics and Gynæcology,
University of Toronto.

Hospital Service Department Notes

Ontario to Check Up on Hospitalization of Indigents

As part of the widespread economy drive on the part of the new government, and in accord with the demands of the municipalities, the Ontario Department of Health has notified the public hospitals of that province to appoint a special committee of three to investigate all indigent patients in that particular hospital. The committees are to be appointed from the medical staffs, and are to examine every non-paying patient charged against a municipality within twenty-four hours of admission. Repeat visits and examinations are to be made at least every seven days and *any* patients no longer requiring hospital treatment are to be so reported, whereupon provincial aid and municipal liability shall cease. The committees shall have access to all case records of such patients, and shall have the right to take whatever action shall seem advisable. It is presumed that the committees are to serve gratuitously.

It will be interesting to receive the annual summary of these reports, for there seems to be a definite difference of opinion between the municipalities and the hospitals as to whether or not undue retention of patients really exists to any extent. Municipalities are quite justified in effecting any real economies, and some hospital accounts must look very large to them. Moreover, it is quite likely that some cases will be found that could be cared for just as well at home if the families would assume the responsibility. At the same time, hospital workers point out that in nearly all well-equipped and organized hospitals the actual per diem cost of maintenance is considerably above the amount received in municipal and provincial grants, and therefore the hospitals try to have such patients discharged as soon as the doctor permits. A major problem facing these committees will be the disposition of those patients who might ordinarily leave the hospital, but whose home conditions are inadequate, and for whom there is no other place to go. It is commendable that the reports are to be made by the representatives of the medical staffs of the hospitals concerned.

The Hospital Situation in France

An interesting account of the hospital situation in France was given by Doctor René Sand, Charter President of the International Hospital Association, before the recent joint conference in London of the British Hospitals Association and the Incorporated Association of Hospital Officers. Most of the public hospitals are municipal ones; in addition there are State hospitals, especially for the Army and Navy; county hospitals, mainly maternities and institutions for the insane, the tuberculous and the aged; private hospitals, belonging mostly to religious bodies and private nursing homes. The municipal or public hospitals have a precarious income, for endowments are few, returns from the local amusement tax are scanty, except in large centres, and payments by patients or from insurance funds seldom meet the deficit which must be met by the taxpayers. As a result the Boards are forced to practise every possible economy, and thus there is constant criticism of the overcrowding and lack of facilities, while the doctors keep a constant grudge against the administration because of superannuated buildings and lack of equipment. Nobody is satisfied, but the system is such that nobody could be. There is no general hospital plan and no linking up of the existing facilities. Apparently there is little if any central control. There remains a considerable number of antiquated, dilapidated, small institutions, in which the sick, the wounded, the aged and the orphans are huddled together, with no operating theatre, x-ray department or laboratory. Even in the bigger

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

hospitals the majority of the nurses have not received a regular training. The accounting is absurdly elementary, although the amount of detailed entries and correspondence required by the central Assistance Publique is simply enormous. The head sister, almost always a nun, manages the kitchen, the laundry, the domestic staff and the household generally.

Despite this dark description, great advances have been made. In Paris the hospitals have a central pharmacy, a central bakery, central stores and a central purchasing department. Many fine hospitals have been erected in Lyons, Rheims, Nancy, and Strasburg. Lille is planning a huge 5,000-bed hospital, including two thirty-floor units, with walls entirely of steel and glass and with conditioned air. The recent development of the sickness insurance plan, involving approximately half of the population, has furnished the hospitals with new financial resources to meet the demands for better accommodation. The linking up of the hospitals under the Assistance Publique has already brought them into closer cooperation with public health activities, particularly in the establishment of clinics and dispensaries of various types, and in Paris an active social service has been instituted. One would gather that Doctor Sand, a resident of Paris and an international authority on his subject, is optimistic for the immediate future of the French hospital system, despite its many still pressing handicaps.

Provincial Association Notes

The Manitoba Medical Association

The annual meeting of the Manitoba Medical Association was held in Winnipeg on September 10th, 11th and 12th. The scientific sessions were held in the Medical College, luncheons and dinners, at the Royal Alexandra Hotel. The meeting was graced by the presence of Dr. J. S. McEachern, of Calgary, President of the Canadian Medical Association, Dr. J. C. Gillie, Port Arthur, President of the Ontario Medical Association, Dr. H. J. Ferrier, Fort William, and Dr. T. C. Routley, General Secretary of the Canadian Medical Association.

The highlight of the scientific program was probably the symposium on "Upper right abdominal pain" on the afternoon of September 10th. Those discussing this subject were Drs. D. C. Balfour, Mayo Clinic, Rochester, B. R. Kirklin, Mayo Clinic, Charles Hunter, Winnipeg, B. J. Brandson, Winnipeg, and L. J. Carter, Brandon. On Monday morning Dr. C. R. Gilmour and Prof. Wm. Boyd conducted a clinical pathological conference on jaundice. The speakers at the luncheon on September 10th were Dr. E. S. Moorhead, who reviewed the present medical economic status under the title "History in the making", and Dr. J. S. McEachern who pleaded for a national outlook in medical affairs.

At the dinner under the auspices of the Medical Alumni Association Dr. Lewis B. Wilson, Chairman of the Mayo Foundation, Rochester, gave a brilliant address on "Present day defects in medical education". Dean A. T. Mathers introduced the new Professor of Surgery, Dr. Jno. A. Gunn.

The program on September 11th included the "Modern treatment of prostatic hypertrophy", Dr. H. D. Morse; "Squint", Dr. C. M. Clare; "Imaginary heart diseases", Dr. J. M. McEachern; "The elbow joint and some of its trouble", Dr. A. Gibson; "Chronic arthritis", Prof. F. T. Cadham; and "Disseminated sclerosis", Dr. A. T. Mathers.

On September 12th the scientific session consisted of papers on "Carcinoma of the lungs", Dr. Lennox G. Bell; "Appendicitis in infancy and childhood", Dr. J. D. McEachern; "Occiput-posterior position", Dr. J. D. McQueen; and "Latent syphilis", Dr. S. C. Peterson.

The annual business meeting was held on September 11th following luncheon. The retiring president, Dr. J. C. McMillan, gave a thoughtful address in which he outlined a scheme of health insurance for all in the province. He suggested how the amount to be contributed by the Provincial Government might be raised. Other speakers were Dr. T. C. Routley who discussed present day medical problems, and Dr. J. C. Gillie who presented an invitation from the Ontario Medical Association for the Manitoba Medical Association to meet conjointly at Port Arthur in May next.

The social events included a dinner given by Dr. J. C. McMillan at the Manitoba Club to the distinguished visitors and the retiring executive, the annual dinner and dance on the evening of September 11th, at which Mr. J. W. Dafoe, Chancellor of the University, gave an address, and the annual golf tournament on the afternoon of September 12th.

The ladies' program included a tea given at 115 Hertford Boulevard, a luncheon on September 11th by Mrs. Currie McMillan to the wives of the retiring executive at the Motor Country club, and a tea at the residence of Mrs. F. W. Jackson, to the wives of out of town members on September 12th.

The new officers will be: *President,* Dr. G. W. Rogers, Dauphin; *First Vice-president,* Dr. F. D. McKenty, Winnipeg; *Hon. Sec.,* Dr. F. W. Jackson, Winnipeg; *Hon. Treas.,* Dr. F. G. MacGuinness, Winnipeg.

ROSS MITCHELL

The Ontario Neuro-Psychiatric Association

The fall meeting of the Ontario Neuro-Psychiatric Association was held at the Toronto Psychiatric Hospital on September 28th, with an attendance of over two hundred. Dr. T. D. Cumberland presided. Dr. C. B. Farrar and the Hon. J. A. Faulkner, M.D., Minister of Health, gave the addresses of welcome.

The program was given by the junior physicians of the Ontario Hospital Service, papers being read by Drs. D. R. Gunn, Ontario Hospital, Toronto; G. H. Hutton, Ontario Hospital, Hamilton; H. C. Moorehouse, Ontario Hospital, Brockville; K. G. Gray, Ontario Hospital, Mimico. Dr. C. M. Hincks, General Director of the National Committee for Mental Hygiene, was the guest-speaker following the Association Dinner, and the evening speaker was the Hon. Dr. J. A. Faulkner.

A motion was passed expressing the loss to the service in the deaths of Drs. N. H. Beemer, F. S. Vrooman, and J. A. McLeod, and sympathy extended to the members of their families.

A. MCCAUSLAND,
Secretary, O.N.P. Ass.

The Saskatchewan Medical Association: Annual Meeting

"We have two vital questions for discussion today," said Dr. George Lee in his presidential address, "State Health Insurance, or some scheme for the nationalization or socialization of medicine in our province, and the attempt at some such scheme which is now in vogue in Saskatchewan—the Municipal Doctor Plan.

"A municipal doctor system has been in operation in Saskatchewan for 14 years. The Act reads: 'The Council may, at a regular meeting or at a special meeting called for the purpose, resolve to submit to the electors a by-law empowering the Council to engage the services of a legally qualified medical practitioner for the municipality at a salary not to exceed $5,000 per annum, and may submit the same to the electors for their approval as hereinafter mentioned.'

"In July, 1934, there were 54 full-time appointments, 43 part-time appointments; 13 municipalities had passed the by-law but no appointments had yet been made, that is, there are 96 actual appointments; and 110 municipalities out of the 306 municipalities in the province, have passed the by-law. Of the 54 full-time appointments, 14 were made before 1930, and 40 since the depression began.

"The population of the municipalities having a full-time appointment varies from 1,050 to 3,190; the salary paid is from $1,800 to $5,000 a year.

"The various municipalities have different ideas as to what particular services should be rendered for the salary paid. They all agree that the salary is for medical services to all residents of the municipality. Some contracts include minor surgery. Very few allow the doctor to make a charge for the first call.

"Some contracts state that a percentage of the regular fee may be charged for major surgery. Others state that major surgery done is to be paid for by the regular salary. One contract calls for major and minor surgery and stipulates that the surgeon must pay the assistant. Another contract states that where the call was deemed unnecessary the doctor may charge the patient $3.00 for livery. One contract states that money received by the doctor for work done under the Workmen's Compensation Act is deducted from his salary.

"Certain contracts state that the doctor must treat all ratepayers, hired help, school teachers and do all dental extractions without charge. Another contract says that he must give all services free to the ratepayers, including free medicine to the value of $500.

"The part-time contracts are less definite. One municipality pays $800 a year as an inducement to practice in the municipality; another pays $420 a year to do all indigent work; another pays $900 a year to do the work of medical health officer and to treat certain indigent cases.

"The law requires that all contracts between a municipality and the municipal doctor must be submitted for the approval of the Minister of Public Health. In practice, this is of no value, as the minister has no authority to enforce his decision in the matter.

"At the last session of the legislature an amendment to the Act was passed, whereby an attempt is made to correct these difficulties by the formation of a Health Services Board, which is composed of the Minister of Public Health, his Deputy, the Deputy Minister of Municipal Affairs, the Chairman of the Local Government Board, the Saskatchewan Commissioner of the Red Cross. This Board is supposed to exercise some supervision over municipal doctor appointments, but as yet has not been put into operation.

"There are a number of places in rural Saskatchewan which have had and are having the conscientious services of doctors in their areas, where the doctors have never made more than a very moderate income and where now they are not making their expenses. These men are carrying on partly because of the realization of the need, and partly because they have a home there and cannot afford to change their location. *The laws which are in existence at the present time are not functioning, and never have functioned, in enforcing responsibility of the municipal districts in caring for the indigent sick.*

"The majority of medical men in the province are not in sympathy with the municipal doctor

plan. The salaries paid, if they are paid at all, are not sufficient. Many of the municipal doctors are opposed to the scheme themselves, but find they are forced to accept anything in these difficult times. The average municipal council has no knowledge of the doctor's overhead expenses; the result is that young medical men find after they have accepted these positions that the salary paid does not provide them with adequate facilities with which to practice. The future of the practice of medicine in our province does not appear to be encouraging.

"This municipal doctor system should be reserved for those communities in which medical services could not well be provided in any other way. Such conditions would be where settlement is very sparse and the amount of work done would not assure a practitioner of an adequate living on any other basis of renumeration.

"The real hardship falls on the established practitioner who has served the municipality for years, has his equipment, his own office, and owns his own home. By decision of the municipal council to call for tenders and the usual acceptance of the doctor who makes the lowest tender, this established physician is obliged to move, even though he may have the majority of ratepayers in favour of his services. A year later the physician who accepted the contract may find that he has to move then, owing to the fact that he was underbid by another doctor.

"The Executive of the Saskatchewan Medical Association and the Council of the College of Physicians and Surgeons have tried to induce the government to introduce legislation to correct the unfairness of the municipal appointments to the profession as a whole, but so far have met with very little success."

Dr. Lee then outlined the plan of state health insurance which had been presented to the Canadian Medical Association at Calgary. He suggested that this report be passed to the joint committee of the Saskatchewan Association and of the Council which has been working on the matter.

Dr. Lee felt that since both the Saskatchewan Medical Association and the College of Physicians and Surgeons were working on the same matters we have duplication and overlapping, with consequent undue expense and inefficiency.

"The problems of the municipal doctor, the treatment of indigents, and state health insurance, are of such vital importance to our profession, especially to the members located in the southern half of the province, where many of them are facing their sixth consecutive crop failure, that ideas of duplication and overlapping of business activities of the two responsible organizations are insignificant."

In accordance with the decision at the last annual meeting the Association was incorporated under the Benevolent Societies Act. Each district named a director.

The district medical societies were repeatedly advised that speakers within the province were available for all meetings, but some district societies did not avail themselves of this service; doctors within the province who have had a large experience are quite willing to give any district society the benefit of their experience.

The Executive met the Council of the College, and had a long discussion over the medical affairs of the province, with particular reference to payment of medical services to indigents. A joint committee was appointed which met the executive of the Saskatchewan Association of Rural Municipalities, to discuss with that organization the difficulties under which the profession was labouring. A delegation of the three organizations then met the government and the whole question was reviewed.

A committee from the Canadian Medical Association had waited on the federal government in an endeavour to have medical services included under direct relief.

Dr. T. C. Routley, accompanied by members of the Saskatchewan Executive, waited on the provincial government. They received a letter from the premier to the effect that the government was in sympathy with having medical services included under direct relief. A final report was made at Calgary at the annual meeting saying that there was little or no hope of having medical services included under direct relief.

A joint committee of the College and of the Association was appointed to deal with two problems: (1) payment for medical services to indigents; (2) the municipal doctor system, and to seek amendments or additions to any Acts to give effect to decisions arrived at. The members of this committee are paid their expenses and an honorarium. Members from the College are: Drs. H. E. Eaglesham, F. H. Hurlburt, and O. M. Irwin; from the Association: Drs. H. H. Christie, V. E. Black, and W. A. Dakin.

The printed copy of the report on Health Insurance, presented to the annual meeting at Calgary, was referred to the Association. Dr. S. E. Moore then presented his further report on health insurance.

The following suggestions regarding the contracts for municipal doctor were given: (1) that a minimum salary be set; (2) that there be two weeks' holiday with pay; (3) that there be four weeks' holidays with pay every second year, to do post-graduate work; (4) that time off be given for attendance at conventions and medical society meetings; (5) that there should be payment for mileage travelled; (6) that there be a definite payment for services, plus actual expenses; (7) that there should be a standard form of contract; (8) that provision should be

made for payment for drugs; (9) that there should be some control over municipal appointments apart from municipal councils; (10) that there should be a re-organization of the Health Services Board.

The motion that an assistant registrar be appointed to visit each member twice a year was carried.

It was suggested that doctors should be circularized, to the effect that no doctor should take on a municipal contract before such contract was passed on by the Council of the College of Physicians and Surgeons.

Officers elected for the coming year are: *Honorary President,* Dr. G. H. Lee, Prince Albert; *President,* Dr. H. H. Christie, Esterhazy; *First Vice-president,* Dr. D. P. Miller, Prince Albert; *Second Vice-president,* Dr. V. E. Black, Moose Jaw; *Secretary-Treasurer,* Dr. A. MacG. Young, Saskatoon; *Directors,* Drs. W. D. McPhail, Kindersley, L. A. Panton, North Battleford, J. A. Matheson, Gull Lake, G. R. Peterson, Saskatoon, H. H. Christie, Esterhazy, Hugh McLean, Regina, V. E. Black, Moose Jaw, H. S. Good, Weyburn, A. W. Argue, Grenfell, and D. R. Miller, Prince Albert.

LILLIAN A. CHASE

Medical Societies

The Academy of Medicine, Toronto

The Annual Dinner and Stated Meeting of the Academy of Medicine, Toronto, was held on the evening of October 2nd in Osler Hall. Following the dinner a replica of the presidential badge of office was presented to the Past-president, Dr. E. A. McDonald.

A very interesting function was the presentation of a portrait of the late Dr. John Caven by his wife. It was an excellent likeness of the original, who in his day was outstanding both as a pathologist and physician. The artist, Marion Long, was among the invited guests. Short speeches were made by the Rt. Hon. Sir William Mulock, Hon. J. Albert Faulkner, Minister of Health for Ontario, President Cody, and the Hon. William Renwick Riddell. Then followed the address of the new President, Dr. M. H. V. Cameron. His remarks, couched in a philosophical vein, contained nothing of a controversial nature, and bore ample evidence of a breadth of mind and depth of culture that one has always associated with the speaker.

In a word, the activities of the coming session were successfully inaugurated.

On October 10th, the Academy of Medicine, Toronto, held a special meeting for the purpose of hearing Mr. Sydney Lamb, of Liverpool, speak on "Contributory health insurance schemes". Mr. Lamb is secretary of the Merseyside Hospitals' Council, and an outstanding leader in the group-hospitals movement in Great Britain. His talk was most enlightening, and showed what wonders can be performed when you secure whole-hearted cooperation. He stressed the importance and ease of collecting money from people when they are well, rather than after they have become ill. Funds collected by his organization through levying only a penny on each pound were sufficient in times of illness to pay 70 per cent of the total cost of maintenance in the voluntary hospitals. Mr. Lamb is an enthusiast who appears to have accomplished a very great deal.

GILBERT PARKER

The Regina and District Medical Society

The Regina and District Medical Society have chosen for their officers for 1934-35 the following: *Honorary President,* Dr. Hugh MacLean; *President,* Dr. J. T. Waddell; *First Vice-president,* Dr. E. B. Alport; *Second Vice-president,* Dr. C. M. Henry; *Secretary,* Dr. J. B. Trudelle. The executive consists of Drs. W. A. Thomson, F. L. Burrows, E. E. Kells, and W. M. R. Palmer.

University Notes

McGill University

The recently completed Montreal Neurological Institute, an integral part of McGill University, was inaugurated with appropriate ceremonies on September 27, 1934. The erection and endowment of this splendid building were made possible by generous gifts from the Rockefeller Foundation, Sir Herbert Holt, Mr. J. W. McConnell, Mr. Walter Stewart, and four anonymous donors. The Government of the Province of Quebec and the City of Montreal are also contributing generously to the annual upkeep of the Institute. Thus, it is not expected that the new department will be any charge on the funds of the University.

Owing to the inclemency of the weather the academic procession which had been planned had to be dispensed with and the authorities and guests assembled individually in the hall.

The inaugural declaration was made by Mr. E. W. Beatty, K.C., LL.D., who, in a brief address, thanked the various donors who had made the undertaking possible, and referred to the inspiring leadership of Dr. Wilder Penfield, the Chief of the Neurological Department. A statue in white marble, a replica of a work by Barrias in the Louvre, "Nature unveiling her-

self before Science", the gift of Mr. and Mrs. A. A. Hodgson and Dr. and Mrs. Lewis Reford, was then unveiled with a few appropriate words by His Worship M. Camillien Houde, Mayor of Montreal.

After this ceremony the staff and guests proceeded to one of the wards on the second floor, where Dr. C. F. Martin, Dean of the Faculty of Medicine, took charge of the proceedings. After briefly reviewing the events that led up to the foundation of the Institute, Doctor Martin spoke in part as follows.

"Scarcely one year has passed since our late Principal, Sir Arthur Currie, in the presence of His Excellency the Governor-General, and amid much pomp and ceremony laid the corner-stone of this building. The project was very dear to his heart, and today we witness the culmination of an achievement, which at no time has been a light task.

"The building is open for your inspection,

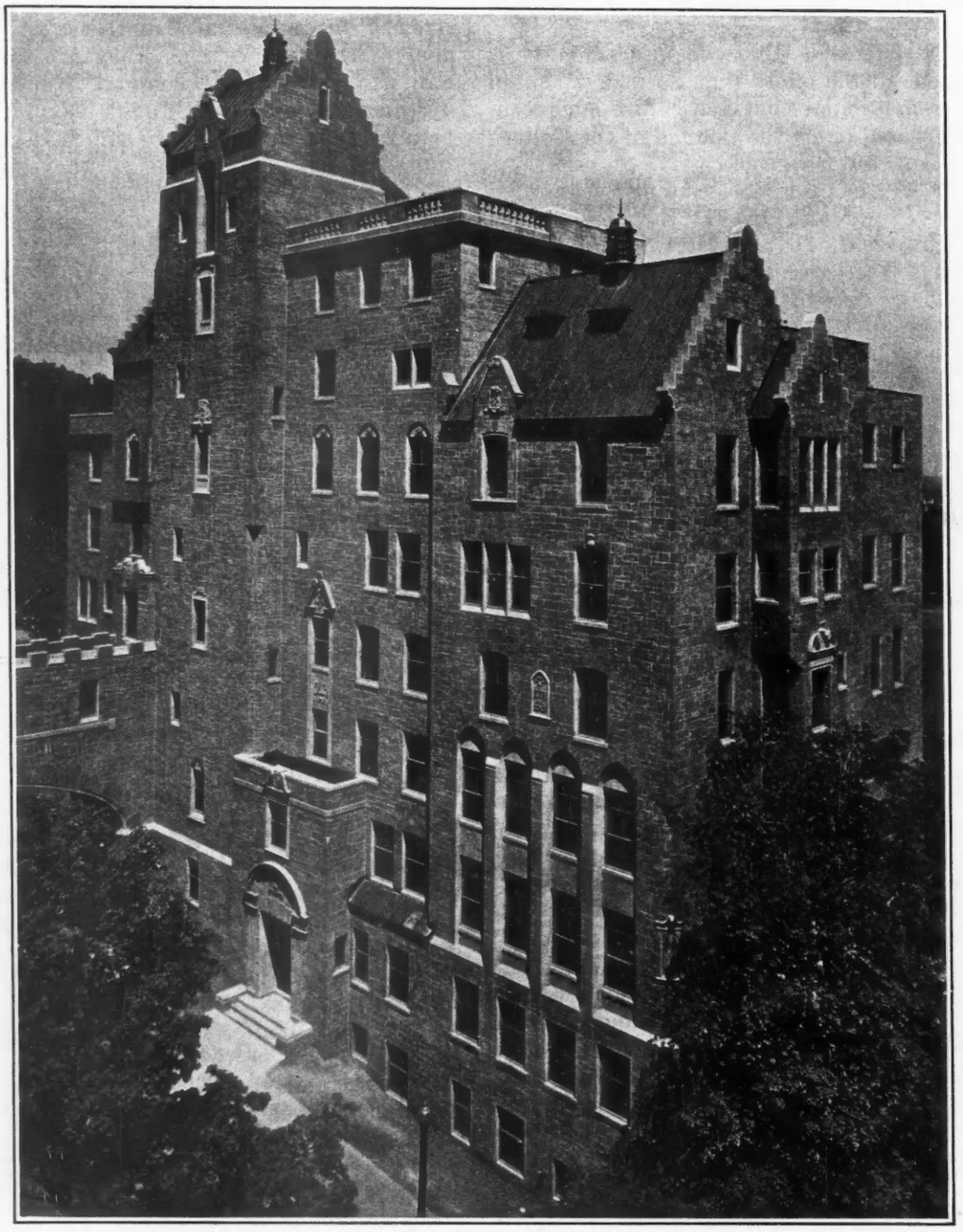

FIG. 1.—Front view of the Neurological Institute.
(Reproduced by courtesy of the *McGill News*)

and indeed is in working order. We shall ever be grateful to Sir Arthur for his sympathetic cooperation, and ever mindful of the generosity of those who made this Institute possible—the finest of its kind—a great asset to McGill University, to the medical profession, and to the community at large.

Next came the foreword by Prof. Edward Archibald, of the Department of Surgery. The

Neurological Institute, he stated, signified a lofty conception and generous purpose.

"To gather knowledge, and to find out new knowledge is the sublimest occupation of the physician; to apply that knowledge with understanding, to the relief of human suffering is his loveliest occupation; and to do both with unassuming faithfulness sets the seal on the whole.

"The earnest man knows that neurology demands his whole life. But his guerdon is great. In no field of labour, perhaps, have intellect and hard work achieved a greater or happier record in the relief of physical pain and mental distress.

"But today, progress depends not alone on intellectual ability but also on the excellence of facilities available. The Neurological Institute has been equipped with these necessary tools, for perfection of tools is requisite to the wresting from nature of her hidden secrets. Therefore," he concluded, "We are confident in the belief that this spacious, well-equipped, building will become an international centre for students seeking a deeper knowledge of neurology. It marks the beginning of a new and promising stage in the field of neurology and the history of McGill's medical school."

Dr. Wilder Penfield, Director of the Institute was the next speaker. He pointed out that the construction of the new healing and research centre meant that there was a determination to make a cooperative study of the problems of the nervous system.

"The task to which this institute must be dedicated in all humbleness of spirit is the achievement of a greater understanding of the ills to which the nervous system is heir, to the end that we may come to the bedside with healing in our hands."

Doctor Penfield spoke of the ambition that Dr. William Cone and he had had for many years, to play a part in the establishment of a research centre of the type now made available, and talked of the many men contact with whom in their work had stimulated him to more and profounder research, and of the spirit of cooperation displayed by both hospitals and institutions of learning here in fostering the study of neurology.

The credit for the establishment of the Institute he passed over to Dr. Archibald and anonymous friends of his whose original conception was forwarded by Dean Martin, who, in turn, was able to interest the Rockefeller Foundation, the Province and the City in the project.

In describing the equipment of the Institute, Dr. Penfield told of his hope that research workers would continue to do a great deal of clinical work, maintaining that something is lost by the laboratory worker who does not come into constant contact with the patient.

Doctor Penfield also referred to the intention of the organizers of the Institute to cooperate closely with the hospitals of the city in order that neurologists of these hospitals would be able to improve their training whenever necessary in the Institute.

In speaking of things still necessary he appealed for the provision of an emergency life saving fund for the provision of blood transfusions and nursing for poor patients and suggested that an income of $1,000 a year would be sufficient for this purpose. There was also a great need for four or five endowed beds for sufferers who are not residents of Quebec. He declared that the 32 public beds provided for neurology and neurosurgery would soon be proved too few. He concluded his speech with the words: "We dare to hope that this is the inauguration of an institute of medicine that is characteristically Canadian, the birth of a Canadian school of neurology."

Dr. Harvey Cushing, Professor of Experimental Neurology at Yale University, was then introduced by Dr. Martin as a graduate of Harvard, who, during the early part of his career, achieved international reputation owing to his discoveries while attached to the staff of Johns Hopkins University.

In his opening remarks, when delivering the Foundation Lecture on "Neuro-surgery", Dr. Cushing brought to the Institute the greetings of Yale University and the felicitations of surgeons across the border. He recalled the active endeavours of a young group of surgeons in his country following the war to begin organized treatment of a large number of veterans suffering from nervous maladies. He described how these endeavours did not meet with fruition, but he believed that they were of some importance in emphasizing to the Rockefeller Foundation the need of such an institute as was being opened at McGill. Now this long-forgotten project had become a reality with the opening of Montreal's centre of neurology.

Dr. Cushing next referred to the slow establishment of chairs of neurology at the various centres of learning on this continent and in Europe. Surgery of the nervous system, he believed, had only reached the threshold of what it holds. He predicted that neurology would for a time subdivide into several subjects for study and development, but that knowledge gained by a greater specialization would in time be absorbed by the physician in such a manner as to lead away from specialization. Much more might be expected of the surgery of the nervous system in the future. Despite the rapid progress of the past twenty years, it was safe to say that only the threshold had been reached in this field. Training involved long years of preparation, but such training would now be available for aspiring neurologists at McGill.

Appreciation of Dr. Cushing's remarks was

expressed by Dr. William Cone, a member of the Institute's staff, who described him as "the father of modern neurological surgery."

Dr. Colin K. Russel then introduced Dr. Gordon Holmes, of the National Hospital, Queen's Square, London, a world-famous neurologist and Editor of *Brain,* who was the next speaker.

After outlining the principal duties and responsibilities of those in charge of the Institute, Dr. Holmes proceeded to deliver the Foundation Lecture on "Neurology". Hand in hand with the treatment of nervous diseases should go a study of normal function, but it was of importance not to become blinded to the risks of isolation from the other branches of medicine. It should be remembered that the nervous system is part of, and guides the acts, of the body.

While it was obvious that all means should be taken for the advancement of knowledge in the field of neurology, it was to be hoped that the bedside study of disease would not be subordinated to work in the research laboratories. If clinical investigation was to bear fruit it must be well directed. There must be accuracy of observation and accuracy of description, and other essentials of a good clinician were intellectual honesty and independence of thought. He warned workers against adopting a frame of mind which placed too high a regard on "magnificence and unrivalled facilities." He reminded his hearers that some of the greatest advances in medicine and science had been made with crude appliances.

For the younger men direction was essential. He recognized the value of laboratory work but stressed the importance of clinical study. In conclusion, Dr. Holmes quoted the qualities regarded by Bacon as most essential for the searcher after truth:

"Desire to seek, patience to doubt, fondness to meditate, readiness to reconsider, and slowness to assert."

The last speaker was Dr. F. H. Mackay, who thanked both Dr. Cushing and Dr. Holmes for their addresses.

Those present included, besides those mentioned, many of the Governors and Professors of McGill University, Sir Andrew Macphail, Dr. W. W. Francis, Dr. S. Boucher, Director of Public Health, Montreal, Dr. Lewis Reford, Professor Masson, Dr. de Bellefeuille, Dr. Van Campenhout, of the University of Montreal.

Eminent out-of-town guests were Drs. Percival Bailey, Chicago; Francis Hall, Boston; E. V. Gowdry, Whipple, New York City, Greenfield, London, England; Burres de Barenne, New Haven, Conn.; Bazett, Philadelphia; Stanley Cobb, Boston; John Fulton, New Haven, Conn.; Kenneth McKenzie, Toronto; Tracy Putnam, Boston; Henry Riley, New York City; Eric Linell, Toronto; Francis Grant, Philadelphia; Max Peet, Ann Arbor, Mich.; Sylvio Caron, Quebec City; W. T. Connell, Kingston, Ont.; H. Auchincloss, New York City; Professor Oberling, Dorothy Russell, London, England; William Ladd, New York City, and Winchell Craig, Rochester, Minn.

FIG. 2.—Science unveiling Nature.
(Reproduced by courtesy of the *McGill News*)

The Institute building is regarded as one of the most outstanding construction projects ever undertaken in Montreal, and its erection has been noteworthy from several standpoints. Its design is the result of prolonged investigation and study, including visits to modern United States medical centres. The type of architecture adopted is distinctive, but it is in harmony with the surrounding Royal Victoria Hospital and McGill University buildings.

The main entrance from University Street is on the first floor. The entrance vestibule itself

is impressive because of the architectural treatment and materials used in construction. It leads to the main reception hall with office and doctors' cloak rooms adjacent. In design and decoration the reception hall is quite a departure from the usual form and colour effect. In general it is modern, but the motifs used signify the history and traditions of medical science.

The reception hall contains a statue bearing the legend, "La Nature se devoilant devant la Science". This is after the statue by Barrias in the Louvre, and is the only artistic attempt to express the conception of biological research. One copy has been made and placed in the Ecole de Médecine, Paris. The replica to be found in the Neurological Institute is the second copy, made by A. Galli in white Carrara marble, although the original was done in variegated marble.

Corridors lead left and right to the lecture theatre, and the photographic and micro-photographic rooms, studies, offices and examination rooms. The second, third, fourth and fifth floors provide the hospital facilities of the Institute. The second and third floors each have four-bed and twelve-bed public wards with the necessary waiting rooms, utility, toilet, laboratory, linen, kitchen and a room for dressings. There are also two observation rooms on each floor for critical cases and recovery. Each floor has connection to an out-door solarium overlooking the Percival Molson Memorial Stadium and commanding a magnificent view. The fourth floor provides two semi-private, three bed rooms, eight private rooms, and one isolation one-bed suite, together with utility rooms, laboratory, kitchen, nurses' room, nurses' stations and sun room.

The fifth floor contains the operating room and visiting doctors' gallery, encephalography room, and visitors' gallery, room for visiting doctors, doctors' dressing room, surgeons' room, instrument cleaning room, gowning station, anæsthesia room, sterilizing and linen rooms. On the same floor are the x-ray department, the suite of consulting and examination rooms, patients' waiting rooms and secretaries' offices.

The sixth floor is set apart for research and consists of offices for the director, the secretary, and neuro-pathologist, laboratories for the chemist, Fellows, pathological Fellow, routine technicians and for individual research workers, a well-equipped library formalin and general storage rooms.

The seventh floor consists of squash racquet courts, treatment room, physiological Fellows' office, physiological room, animal rooms and animal kitchen.

The eighth floor provides complete residential accommodation for eight Fellows.

Apart from the significant fact that in the completion of this outstanding building, Montreal and the Dominion of Canada have a medical institution far in advance of anything of its kind in the world, the manner and absolute smoothness in which every detail in connection with its planning and construction was accomplished, has been a remarkable tribute to Canadian design and workmanship.

Special Correspondence

The Edinburgh Letter

(From our own Correspondent)

The advent of October marks the end of the holiday season and the commencement of the work of a new session. The University medical classes opened in the beginning of the month, and the various scientific societies have now resumed their activities. In Edinburgh these societies meet in the Scottish House of the British Medical Association, which is conveniently situated and well equipped for the purpose. Any member of the Canadian Medical Association visiting Scotland or studying for one of the higher qualifications will be welcomed if he calls at the Scottish House.

A significant development in the medical services of Edinburgh has taken place recently. Through the initiative of the Edinburgh Division of the British Medical Association a Public Medical Service was inaugurated on the 1st of October. The Service has been organized to provide medical attendance for the dependents of insured persons and others of similar means within the bounds of the City. Its purpose is to enable people who find it difficult to pay doctors' fees in the usual way to obtain medical advice and treatment on a contributory basis by becoming subscribers to the Service. The rates of subscription are so fixed as to give some advantage to the person with a number of dependents. A family of one subscriber pays 4d. per week; two pay 8d; three pay 10d; and four or more pay 1/-. In other words a family of four or more persons secure the attendance of their doctor for 52/- a year. To encourage people to join the Service before they become ill a fee of 7/6d. is exacted if they only apply for admission when they are actually ill. Normally the subscriber will pay an entrance fee of 1/-. In return for his subscription he will be entitled to such medical and surgical treatment as general practitioners as a class may reasonably be expected to provide, the treatment being given either at the medical attendant's surgery or at the patient's home if the latter's condition makes it necessary. In the case of emergency the doctor will render whatever services he considers to be in the best interests of the patient. The subscriber will also be entitled to all ordinary medicines and appliances as are supplied under National Health Insurance

regulations, or as shall be determined from time to time. Normally, a subscriber must choose as his medical attendant a practitioner who is a member of the Service, although special arrangements have been made for cases where a subscriber chooses a practitioner who is not a member of it. This provision is necessary so that reasonable publicity may be given to the Service as such. There are certain limitations to the benefits available under the scheme. The following services are excluded:—attendance at confinements, vaccination, administration of general anæsthetics, certificates and reports, attendance at operations requiring general anæsthetics and examinations, Court attendances, etc under Common Law, Workmen's Compensation, Employers' Liability, and other statutes. The subscriber is permitted to change his medical attendant at any time on notifying the secretary of the Service, and a doctor may similarly terminate his contract with the subscriber at any time. The establishment of such a service bridges a gap that exists under the National Health Insurance scheme. It is highly probable if the Service is fully supported by the public whom it is designed to serve that other centres in Scotland will follow the lead given by Edinburgh. A number of similar services have been operating successfully in England for a considerable time.

R. W. CRAIG.

7 Drumsheugh Gardens,
Edinburgh.

The London Letter

(From our own Correspondent)

The report of the Chief Medical Officer of the Ministry of Health is each year one of the most important documents issued from official sources. In it the chief statistical records of the past year are surveyed and supplemented. From it we learn that in 1933 the high standard of recent years is being well maintained. It is the exceptions to the generalization which hold most interest for the student of preventive medicine. Tuberculosis in the adolescent girl remains an anxious problem, since this age-group does not share in the general decline of the disease. Too many deaths are to be attributed to the motor-car; cancer mortality continues to increase, (perhaps because there are relatively more old folk in the population); while the entrants to school and the army are in a physical state which in too many instances leaves much to be desired. The biggest blot on the otherwise clean record, however, is the maternal mortality rate which is actually by a fraction the highest recorded since this method of statistics was adopted in 1911. Certain towns and areas are specially mentioned as having a persistently high rate, while the Queen's District Nurses and certain maternity hospitals are shown to have a death rate only about a quarter of that for the country as a whole. The effect of the prolonged unemployment upon health is carefully analysed. It seems clear that, while there is little evidence of malnutrition, ill-health of a neurasthenic type is on the increase in certain districts. Slowness of recovery after illness and anæmia among women in the North are also specially noted by medical officers of the Ministry's staff. There is the risk that undernourishment and mental instability may take some time to show themselves, but, as viewed at present, on the whole the health of the unemployed and their dependents is not suffering seriously or generally.

It is instructive to set alongside this health balance sheet the more financial aspects of the position as illustrated by the full returns for the voluntary hospitals of these islands now available for 1932. With an income in all of over fifteen million pounds there was actually a surplus of nearly three-quarters of a million. The voluntary basis was well maintained, and the amount in London donated per bed in the year works out at £83, an increase of £3, at a time when economic conditions were by no means settled. The contributions from patients also have shown a steady rise and stand at £68 per bed. On the other side of the balance sheet are set out the costs—worked out on a "bed" basis, although the cost of the out-patients departments is included. For London the annual cost was £228; in the provinces £132; and in Scotland £121. There are curious variations even amongst comparable institutions, and the teaching hospitals in London vary from £5 per week to just over £3. An interesting comparison is given with certain large county council institutions in London with weekly cost from £4.14s to £2.12s. These are impressive figures for a healthy population, and, to conclude, it may be mentioned that the total number of new out-patients for the year is well over five million, or about one in nine of the total population.

The British Association has just concluded its meetings in Aberdeen, and, while your Edinburgh correspondent will no doubt see fit to describe how the medical practitioner in Scotland viewed the proceedings, the larger audience of the south has also been supplied with very full reports of many interesting meetings. It was particularly happy that the physiological and agricultural experts met together to discuss aspects of nutrition, for it is now becoming more and more recognized that diet is the most important factor affecting the health of the community. Approximately half the babies and women of the poorest classes are estimated to be anæmic, and while iron salts represent a cheap and efficient remedy it would be more satisfactory to carry the matter a stage further back to proper diet. There has apparently been a greatly increased consumption of the "protective foods" in recent times, such as milk, eggs, fish, fruit and fresh vegetables, but in another meeting it was emphasized that humanity was suffering more gravely from lack of vitamin C than had been realized prior to the

isolation and therapeutic trials of this factor in a pure state. Mrs. Mellanby testified to the dietetic factors involved in the production of the still widespread dental caries, while the mineral deficiences were also described in relation to the phosphorus content of the pasture. The president, Sir James Jeans, defended scientific progress against the various charges brought against it, and he pressed for more planning to secure wealth, leisure and dignity of life.

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Topics of Current Interest

The Increasing Menace of Marijuana

Although as appalling in its effects on the human mind and body as narcotics, the consumption of marijuana appears to be proceeding virtually unchecked in Colorado and other Western States with a large Spanish-American population. The drug is particularly popular with Latin Americans and its use is rapidly spreading to include all classes.

The poisonous weed which maddens the senses and emaciates the body of the user, is being sold more or less openly in pool halls and beer gardens throughout the West and Southwest, and, according to some authorities, it is being peddled to school children. The Federal Government is powerless to stop the traffic, officials of the Narcotic Bureau say, because marijuana was left out of the Harrison Act under which the bureau gets its authority to stop the traffic in opium and its derivatives. The seriousness of the problem, growing out of laxity in enforcing State laws barring the drug, is indicated by the fact that it is same weed from which the Egyptian hashish is made. The plant grows wild in many parts of the United States, but when cultivated it is usually concealed in a stand of some other high-growing crop such as sugar beets, alfalfa or corn. After it grows to a height of three or four feet it blossoms and is cut and dried. The leaves and blossoms are then packed in ordinary pocket-size tobacco tins which retail at $3 to $5 each and contain enough "hay" to make thirty or forty cigarettes, one of which is enough to intoxicate the smoker.

The sensations of the addict are wholly different from those of the user of narcotics. Users of marijuana become stimulated as they inhale the drug and are likely to do anything. Most crimes of violence in this section, especially in country districts, are laid to users of the drug. However, it is said that the marijuana habit can be more easily broken than that of narcotics.

The weed's toxic qualities are not confined to men, but have equally deleterious effects on animals. Kin to the loco weed, marijuana when mixed with hay causes death to the horses that eat it.—*The New York Times*, 1934, Sept. 16th.

The Making of a Practitioner

C. F. Martin stresses the point that, in most of our medical schools, students are admitted on a plan so well defined that they progress from one year to another as in school. He submits that, for the most part, this is instruction but is not education—there is a difference. This inadequacy of our academic program has been the subject of adverse criticism for many years. The recent criticisms of the Commission on Medical Education seem justified, yet—thanks to generous foundations and persons—the facilities, equipment and opportunities never were better. Instead of forcing the vital effort of discovery in the pupil, he is crammed to the full with facts, many of which he has no interest to learn, because the interest has not been instilled into him. In this era of standardization, mass-production in medicine, as in material things, has become the vogue, if not the necessity. The only possible excuse—other than state control—for taking on more students than are required must be a financial one—they must pay for the extravagance in equipment. The author believes that a student should arrive at a university more mature, capable, to some extent at least, of selecting his own education as a result of a good preliminary training. After such preliminaries, he would enter the medical school as to a graduate institution, and with all the self-reliance and confidence necessary for self-education. This, however, happens only to the few. Rather than divert his clinical investigation from the bedside, the student should be taught, first and foremost, to use his own plain senses, his eyes and ears and hands, which he always has with him. When, too, as a senior student, he observes, as he surely will, the hospital physician in his daily rounds, allowing his syndicate of laboratory workers, who never see the patient, to determine the final decision of a diagnosis and even to dictate the treatment, it is surely time to review the situation in the clinical field. For the young physician in practice, laboratory research can be undertaken with credit only by the very few already well versed in method. Like Portia's suitor, the practitioner must choose between the caskets and hazard all; it is rarely that one can serve two masters at the same time and do one's duty to both faithfully and well. With the doctor, as with the fireman, when he is wanted, he is wanted badly. It is not enough to be told that he is in his experimental laboratory or at the golf club. The edifice of medicine rests entirely on facts; and the truth or the facts can come only from careful and complete observa-

tion, which surely is concerned, first and foremost, with the patient rather than the test tube. —*J. Am. M. Ass.*, 1933, **101**: 652.

Teaching Methods in Medicine

Dr. W. D. Reid, of Boston, has written a small book (privately printed)* upon teaching methods in medicine which is both valuable and timely. There has been much writing of late upon medical education; in some quarters its discussion has been upon far too narrow a basis. Only a small part of the problems involved has received consideration when an ideal curriculum has been propounded, which is the form that most contributions to the discussion have taken. Dr. Reid reminds us that it is of at least equal importance to consider the medical student as a human being and in what manner he can best be taught. Some who have had personal teaching experience will agree with the author that the question of how medicine should be taught is the primary one, the other question of what the student should be taught being only capable of answer after adequate discussion of the first. Dr. Reid has sat at the feet of the educational psychologist to his and his readers' great advantage. He draws attention to the fact that the science of education has undergone revolutionary changes of late years, one of the fundamental changes being that the scholar or student is not now thought of as a recipient so much as a partner in his own education. The teacher is no longer the pedagogue and imparter of masses of facts, failure to absorb which is held to be suitably corrected by punishment and the "plough". This time-honoured conception has been replaced by one of the tutor as a director of learning, stimulating and guiding the pupil in a process of self-education. There is a general agreement among those who have knowledge of methods founded upon both these ideas that those based upon the second produce results far superior to those based upon the older. Dr. Reid pleads for the application of this experience to the medical school. The idea that the teacher is "teaching, not subjects but pupils", is one which if worked out in medical schools would lead to revolutionary changes in many; it would, in the first place, demonstrate the folly of endeavouring to crowd into the curriculum a good deal of what it is now made to hold—of facts to be memorized. In this little book the author begins by reviewing the psychology of learning, and passes on from this to a discussion of teaching plans and techniques, major, minor, and general; finally, he considers the specific application of such plans to medical teaching. He asks pertinently whether a good deal of the time at present devoted to didactic instruction might not be better occupied in guiding the student to teach himself medicine in the wards and clinics through the medium of the personal examination of patients. Something of this kind has long been the practice of British schools—the dresser and the clinical clerk have been trained mainly in this way—but even in the clinical part of the curriculum the method might, advantageously, be further worked out. Much of the remainder of the course would gain by a revision in the light of the new but well-founded principles which the author reviews. He has done this both clearly and temperately, and we commend his discussion and suggestions to the notice of all concerned in medical education.—*Brit. M. J.*, 1933, **2**: 1177.

* Teaching Methods in Medicine. Written and published by William Duncan Reid, M.D., F.A.C.P., 510, Commonwealth Avenue, Boston, Mass. (1 dollar.)

Mme. Curie

Mme. Curie, who died recently, had a world-wide reputation as the most distinguished woman investigator of our times. Her claim to fame rests primarily on her researches in connection with the radioactive bodies and particularly for her discovery and separation of the new element radium which showed radiating properties to a marked degree.

Marie Sklodowska, as she was before her marriage, was born on November 7, 1867, at Warsaw, and received her education there. She early showed a deep interest in science, and went to Paris to attend lectures in the Sorbonne. In 1895 she married Pierre Curie, a young scientist of great promise.

Mme. Curie continued her scientific work in collaboration with her husband, but the direction of their work was changed as the result of the famous discovery of Henri Becquerel in 1896, who found that the element uranium showed the surprising property of emitting penetrating types of radiation, which blackened a photographic plate and discharged an electrified body.

Mme. Curie showed that the radioactivity of uranium was an atomic property, as it depended only on the amount of uranium present and was unaffected by the combination of uranium with other elements. She also observed the striking fact that the uranium minerals from which uranium was separated showed an activity four to five times the amount to be expected from the uranium present. She correctly concluded that there must be present in uranium minerals another substance or substances far more active than uranium. With great boldness she undertook the laborious work of the chemical examination of the radioactive mineral pitch-blende, and discovered a new strongly active substance which she named polonium, after the country of her birth. Later she discovered another new ele-

ment, allied in chemical properties to barium, which she happily named radium.

The importance of this discovery was at once recognized by the scientific world. In 1903 the Davy Medal of the Royal Society was awarded jointly to Professor and Mme. Curie, while in 1904 they shared a Nobel Prize with Henri Becquerel. After the death of Pierre Curie in a street accident in Paris in 1906 Mme. Curie was awarded in 1911 the Nobel Prize in Chemistry for the discovery and isolation of the element radium. In 1906 she was appointed to a special Chair in the Sorbonne and was the first woman to obtain this distinction. Later a special Radium Institute, called the Pierre Curie Institute, was founded for investigations in radioactivity, and Mme. Curie became the first director. She held this post at the time of her death.

The death of Mme. Curie removes one of the most historic, romantic, and beloved figures of science. Marie Sklodowska had science in her veins, but, as has not infrequently been the case with scientific workers, she became involved during her student days in Warsaw with a revolutionary organization. Fortunately for science, she moved first to Cracow, then to Paris. Her marriage to Pierre Curie is a symbol of the way in which science unites the nations, and their subsequent life together is one of the happiest examples in scientific annals of harmonious collaboration. In 1898, following the discovery of radioactivity by Becquerel, with the help of mineral deposits placed at her disposal by the Austrian Government, she made her great discovery of polonium and radium, for which her name will be honoured by unborn generations. To few is it given to see in their lifetime such fruits of their labours as she has seen. Her discovery of radium was one of the keys which opened the door to the new and startling physics of the present age; and it also opened up new avenues in medicine along which thousands of sufferers have found relief. The possibilities of her discovery, especially in medicine, are still far from fully realized. She received the outward expression of the world's thanks in innumerable honours, not least in that the unit of radium dosage is named after her. But perhaps her greatest reward is the brilliant partnership between her daughter and M. Joliot, by which her particular line of work is being brought to a magnificent consummation in her own family.—*The Weekly Times,* July 12, 1934.

That is the true and chief joy, which is not conceived from the creature but received from the Creator; which (being once possest thereof) none can take from thee: whereto all pleasure being compared is torment, all joy is grief, sweet things are bitter, all glory is baseness, and all delectable things are despicable.—St. Bernard.

Abstracts from Current Literature

Medicine

The Heart in Myxœdema. Ohler, W. R. and Abramson, J., *Arch. Int. Med.,* 1934, **53**: 165.

The authors report observations on 35 cases of myxœdema, 13 of which showed changes in the electrocardiogram. These changes consisted in a decreased voltage of all the complexes and frequently an inversion in the T waves in all leads. Clinically, distant heart sounds and mild congestive failure were common findings. The blood pressure was not characteristic, but tended to be normal or sub-normal. Cardiac enlargement, revealed by roentgenograms, was seen frequently in cases showing abnormal electrocardiograms. Sluggishness of cardiac contractions was also demonstrable by fluoroscopy. Under thyroid medication, the electrocardiogram and size of the heart returned to normal in all but one case. Among the various causes suggested for the cardiac changes are anæmia, cardiac dilatation, vagal stimulation, cutaneous resistance, and pericardial effusion. In one case only was there any suspicion of pericardial effusion on fluoroscopic and roentgenographic examination. In the authors' opinion none of the existing theories serve as an adequate explanation for all cases. They stress the dangers of overdosage of thyroid extract in uncontrolled thyroid medication. They cite the case of a patient who died suddenly in an attack of angina pectoris following excessive amounts of dessicated thyroid substance.

LEYLAND J. ADAMS

The Relations of Polycythæmia to Duodenal Ulcer. Boyd, W., *Am. J. M. Sc.,* 1934, **187**: 589.

Boyd reports the case of a man of 37 admitted because of abdominal pain of ten months' duration, and shortness of breath of a few weeks' duration. Examination revealed, in brief, a duodenal ulcer, an enlarged liver and spleen, ascites and a polycythæmia of moderate degree. He died of a gastric hæmorrhage. At post-mortem two duodenal ulcers were found, one of which had perforated, giving rise to general peritonitis. The liver and spleen were considerably enlarged from chronic passive congestion. The heart showed a thrombosis of the left coronary artery with infarction. The bone marrow was decidedly hyperplastic.

Boyd points to the frequency with which true polycythæmia and duodenal ulcer have occurred in the same patient. He suggests that in his patient the polycythæmia was the causative factor for both coronary thrombosis and the duodenal ulceration. The increased blood volume and viscosity as a result of erythræmia, it is suggested, led to arterial occlusion, first in the

duodenum with resulting necrosis and ulceration, then in the left coronary artery with subsequent infarction of the heart.

E. S. MILLS

The Value of the Negative Intracutaneous (Mantoux) Test in Adults. Lichtenstein, M. R., *Am. Rev. Tuberc.*, 1934, **29**: 190.

The intracutaneous tuberculin test should be more widely used as a diagnostic measure in adults, because it has been established that all tuberculous adults will react to adequate doses of tuberculin, unless the patient is moribund, and because normal adults will nowadays be found tuberculin-negative in a sufficient proportion to justify a wider use of the test in adults.

The most difficult type of case for diagnosis is that suspected of early pulmonary tuberculosis, with negative sputum, dubious x-ray, and inconstant or slight physical findings. Of 162 such cases the writer found 14, or 8.6 per cent, completely insensitive to all dilutions of tuberculin. He started testing with 1:100,000, 1:10,000, and 1:1,000 dilutions. If negative, the 1:100, 1:10, and 1:1 (full strength) dilutions were used. In each case the dose given was 0.05 c.c. Nine cases, or 5.6 per cent, reacted only to one of the dilutions stronger than 1:1,000. The test quickly excludes as non-tuberculous an important number of suspects, and it is probable that active tuberculosis can be ruled out in the group who fail to react to 0.5 c.c. of a 1:100 dilution.

T. G. HEATON

Surgery

Changes in the Bone in Hodgkin's Granuloma. Craver, L. F. and Copeland, M. M., *Arch. Surg.*, 1934, **28**: 1062.

The authors have made a study of 172 cases, in which the diagnosis was found to have been confirmed by biopsy or autopsy, out of a total of 396 cases registered as Hodgkin's granuloma in the Hospital for Cancer and Allied Diseases at Baltimore. In 27 cases there were demonstrable bone changes. Of interest was the variable duration of Hodgkin's granuloma before and after definite invasion of the bone. In 12 persons changes occurred within two years after the onset of symptoms, while in 15 the disease was evident from two to four years before the changes in the bone. In those who died, skeletal changes were noted from two months to two years prior to death.

A dull aching or severe lancinating pain preceded the invasion of the bone in 17 cases. This was produced either by invasion of the nerve roots, by pressure on the nerve, or by destruction of bone. Fever accompanied by a slight albuminuria was frequently associated with the disease, especially in its active stage. Bence-Jones bodies were not found in the urine. The blood picture varied from a normal blood count to one showing marked secondary anæmia. The bones involved in order of frequency were: vertebræ, sternum, pelvis, femur, ribs, skull, humerus, scapula and clavicle.

Roentgenograms showed the osseous lesions to be either predominantly osteoplastic or osteoclastic. A histopathological study of the lymph nodes showed changes varying from those of Hodgkin's granuloma with marked fibrosis to those of Hodgkin's disease with sarcomatous features.

The main reliance in the treatment of Hodgkin's disease is to be placed on irradiation, preferably the roentgen rays.

G. E. LEARMONTH

Acanthoma of the Anus. Hankins, F. D. and Harding, W. G., *Arch. Surg.*, 1934, **29**: 77.

Acanthoma or pavement-cell carcinoma of the anal canal is of rare occurrence. The authors report 3 cases. Only 40 cases have been recorded in the literature during the past twenty years. This malignant lesion arises at the mucocutaneous junction, and is sharply demarcated; ulceration develops late in its course. The growth may be any one of three types; (a) exophytic, (b) exuberant, (c) endophytic. The endophytic variety may occupy the anal canal without producing an externally visible tumour. Clinically, there may be a period of constipation before localizing symptoms appear. Later the patient has a sense of fullness in the rectum, difficulty in expelling the fæces, and slight bleeding. Chronic irritation seems to be a factor in the production of this growth, associated with such lesions as fissures, fistulæ and hæmorrhoids.

Pathologically, these growths are of a comparatively low degree of malignancy. If the growth is removed in its early stages, preferably by cautery, cure may result. In the later stages the anal canal and lower portion of the rectum should be radically resected and an extensive resection of the inguinal nodes performed.

G. E. LEARMONTH

Carcinoma of the Penis. Horn, K. W. and Nesbit, R. M., *Ann. Surg.*, 1934, **100**: 480.

About 2 per cent of all epithelial tumours are found on the penis. The disease usually appears after 50. There is no racial immunity. Carcinoma of the penis has never been noted in an individual circumcised in infancy; the chief predisposing cause is therefore phimosis. Traumatism is an occasional factor. Carcinoma may follow circumcision in adult life, particularly if there has been delayed healing or prolonged induration. Two groups of penile cancer are recognized, *viz.*, (1) papillary and (2) indurated ulcer.

Carcinoma of the penis usually arises from the epithelium of the prepuce or glans. Rarely, it commences in the mucous membrane of the urethra. Extension to the corpus cavernosum is prevented by its dense fibrous sheath. Extension to regional lymph glands is late. Secondaries appear first in the inguinal lymph nodes, and next in the lumbar glands. Any organ or tissue in the region may be involved by direct extension.

Early subjective symptoms are negligible. A papillary epithelioma forms, which may remain for a long period. Infection and ulceration follow. Chronicity is one of the chief characteristics. Treatment is delayed because pain is a late development. All papillary growths on the glans are potentially malignant. The lesion may be confused with (1) a benign papilloma, (2) syphilis, or (3) sarcoma.

Methods of treatment varying from palliation to complete emasculation have been described. The method adopted should depend upon the degree of pathological change present. Emasculation is only necessary when direct extension to the scrotum has taken place.

STUART GORDON

Obstetrics and Gynæcology

Hæmoperitoneum resulting from Hepatic Birth Traumatism. Rogers, G., *Am. J. Obst. & Gyn.*, 1934, **27**: 841.

Injuries to the fetal liver are by far the most common of the intra-abdominal birth traumatisms. Asphyxia and trauma, causing compression of the liver, are important etiological factors. Bleeding results from rupture of the capsule over subscapular hæmatomas or rupture of the hepatic parenchyma. Early diagnosis is essential if the infant is to survive. A safe and reasonably accurate diagnostic procedure readily available is abdominal paracentesis.

The symptoms are marked pallor, restlessness, painful cry, subnormal temperature, perspiration, shallow and laboured respirations, and abdominal distension with a possible fluid wave in advanced cases.

Treatment is prophylactic and surgical. Procedures to be avoided are: (1) pituitrin in the first stage of labour; (2) too forceful Kristeller expression in delivery of the shoulders; (3) sudden flexion of the fetal spine after delivery, due to attempts to grasp the slippery infant; (4) traction on the umbilical cord; (5) all methods of resuscitation of the newborn which in themselves may produce visceral trauma, *viz.*, Schultze's swinging, etc.; (6) careless handling of infants of excessive size or of any infant born after a difficult labour.

Once the diagnosis is established, immediate blood transfusion should be done, preferably with citrated blood, followed by laparotomy, exposure of the bleeding point, and hæmostasis with suture and pack.

ROSS MITCHELL

Mild Symptoms from Rupture of Follicle Cyst or Corpus Luteum. Pratt, J. P., *Am. J. Obst. & Gyn.*, 1934, **27**: 816.

Ectopic pregnancy and twisted pedicle are more likely to be confused with fulminating than mild ovarian hæmorrhage, so that in either instance operative treatment would be necessary. From a practical point of view the main problem for differential diagnosis is the distinction between appendicitis and mild symptoms from irritating fluid from the follicular apparatus.

The differentiation of symptoms due to rupture of follicle cyst or corpus luteum from those due to obstructive appendicitis is most urgent, because of the rapidly progressive symptoms in the latter. Suddenness of onset is characteristic of both, but with the obstructed appendix the vomiting is usually much more pronounced, pain is more intense, temperature more elevated, and the leucocyte count higher. The trend of events will soon establish or disprove the presence of obstructive appendicitis. Observation for one or two hours will usually suffice to establish this trend, and the treatment can be determined accordingly. The inflammatory type of appendicitis cannot be differentiated so quickly, for the onset is more insidious and the progress slower, but for this reason it is safe to observe the inflammatory type longer before final decision is made.

Disturbance of the follicular apparatus usually produces maximum tenderness below McBurney's point. Repeated attempts by patient and examiner will help to fix the localization satisfactorily. Confirmation may be obtained during bimanual palpation and manipulation of the ovary. The temperature seldom exceeds 100° F. in these mild cases when uncomplicated. A corresponding moderate leucocytosis is also the rule.

For a woman seen in the active reproductive age, having the onset pain in the lower abdomen during the middle or latter half of the intermenstruum, accompanied with tenderness over the ovary, slight elevation of temperature, and mild leucocytosis, even in the presence of anorexia, nausea and occasional vomiting, the diagnosis of irritation from fluid coming from the follicle or corpus luteum should be strongly considered. In case of doubt laparotomy is to be advised owing to the seriousness of neglected appendicitis. If, however, appendicitis can be excluded, follicular fluids and small amounts of blood are absorbed and leave no residue. The incident is soon over and the patient's health is not impaired.

ROSS MITCHELL

Pædiatrics

Fatal Poisoning with Salicylate of Soda. Paisseau, G., Friedman, E. and Vaille, C., *Bull. et Mém. Soc. Méd. d. Hôp. d. Paris,* 1934, 3rd ser., **50**: 1201.

It is generally accepted that large doses of salicylate of soda are a necessity in the treatment of rheumatic conditions. Some authorities give regularly as much as 15 to 20 grams daily in the adult. In the child rheumatism is apt to be more severe, and so the tendency is to give here proportionately larger doses. Thus, many would give 10 grams daily to a child of eight to twelve years of age. As a safeguard against untoward effects a double amount of bicarbonate of soda is given with the salicylate (Lee's method). The authors report a fatal case of poisoning in the course of the therapeutic use of salicylate. Such an event is, of course, very rare.

The patient was a girl, ten years old, admitted to hospital with the diagnosis of progressive rheumatic endocarditis. She had had acute polyarticular rheumatism eight or ten weeks before, followed by chorea. Her temperature was 100.4°; pulse, 156. There was a soft blowing systolic murmur at the cardiac apex transmitted towards the axilla. The liver was of normal size, and the urine did not contain sugar or albumin. Ten grams of salicylate of soda and 20 grams of bicarbonate of soda daily were administered. This amount was badly borne and two days later was reduced to 2 grams of salicylate intravenously, and 5 grams plus 10 grams of bicarbonate daily by enema. This medication was continued for three days. The amount of urine excreted was between 500 and 1,000 c.c., without albumin. On the fourth day after admission the child was weaker, more excitable, though mentally dull, and complained of feeling hot. On the fifth day her appearance was alarming. She was pale, haggard, and very restless. She vomited occasionally. Between times she was dull. Respiration was deep and noisy. The salicylate was stopped and bicarbonated saline was given as an enema. Signs of acidosis were apparent. During the afternoon of the same day the respirations were 26 to the minute and of the Küssmaul type. The pupils were contracted. The tendon reflexes were weak. The breath smelt like chloroform. Glycæmia was detected, and ketone bodies were present in the urine, which was diminished in amount. Bicarbonate-saline was given intravenously, subcutaneously, and by enema, and bicarbonate by the mouth, the total amount of bicarbonate being 54 grams. Also 10 units of insulin were given. Slight improvement ensued and continued until the afternoon of the seventh day. Erythema then appeared on the chin, neck, and the upper part of the chest. On the same evening the child became cyanosed, had convulsions, and went into coma, despite an intravenous injection of hypertonic (30 per cent) glucose saline. Death finally occurred. At autopsy were found, intense congestion of the bases of the lungs, extreme fatty degeneration of the liver, and congestion of the kidneys. There was a slight serosanguineous effusion into the pericardium. A small, partially organized clot was found on the edge of the mitral valve. There was no ulceration here.

JOHN NICHOLLS

Ophthalmology

Retinal Detachment and its Treatment by Surgical Methods. Shapland, C. D., *Brit. J. Ophthal.,* 1934, **18**: 1.

This paper consists of a study of 425 cases of simple detachment of the retina at the Royal London Ophthalmic Hospital. Operation by cautery puncture was done on 221 cases; a multiple trephining operation was performed on 79; and in 72 cases diathermy was used. Trauma, direct and indirect, appears to have played a small part in the etiology of myopic detachments, and, as might be expected, has occasioned a larger proportion of those occurring in emmetropia. Spontaneous detachment is therefore the rule in myopia, trauma of relatively frequent import as an etiological factor of retinal detachment occurring in emmetropia. Retinal holes appear as round holes, disinsertions at the ora serrata, arrow-head or horseshoe-shaped holes, slit-like tears, and irregular rents.

A diagram shows that the temporal half of the globe is by far the commonest site for a retinal hole, 79.6 per cent of all tears in the series occurring in this situation. The infero-nasal is the quadrant in which a retinal hole is least commonly found, but a retinal detachment of course occurs here frequently, as the sub-retinal fluid tends to gravitate downward; hence the supero-nasal quadrant becomes the situation in which the retina is most likely to be found *in situ.*

The pathogenesis of retinal holes is considered under trauma, direct or indirect, degeneration, detachment and traction of the vitreous body, focal retinal necrosis from acute choroido-retinal inflammation, and retinal degeneration. The hole need not necessarily be found on that portion of the retina which is detached at the time of examination, as the sub-retinal fluid in relation to a detachment commencing above usually gravitates downward, so that in a detachment of some standing the hole may be found on a flat or apparently detached portion of the retina. Of the cases operated upon by cautery puncture, 27.6 per cent were cured and 10.4 improved. Of the cases operated upon by the Guist-Lindner method, 25.3 per cent were cured and 15.2 improved.

There are two main methods of treating retinal detachment by diathermy, that devolved by Weve, of Utrecht, and that introduced by Larsson, of Stockholm. The latter method has been followed at Moorfields. Of all cases operated upon by diathermy 47.2 per cent were cured and 13.9 improved.

The article is illustrated with numerous diagrams and plates. S. HANFORD MCKEE

A New Ocular-Palpebral Syndrome. Borel, G., *Ann. d'Ocul.*, 1934, **171**: 207.

This is a report about a child of three years, well nourished and intelligent, who came to consultation because of swelling of the upper lids, with consequent ptosis. The only symptom present was a small amount of pus in the eyes. The child had been operated upon many times without success. The eyes looked normal, except for conjunctival redness, and there was some photophobia. On the upper lids of both eyes was seen an odd fatty tumour of cartilaginous consistency, weighing a few milligrams, the surface being irregular, with large symmetrical pedicles.

The condition is a nosographic entity of a chronic infectious nature, of grave prognosis, being generally fatal, and is accompanied by high fever and membranous complications of the nose and throat. It is not transmissible by inoculation to animals, and is refractory to culture as well as to treatment. It attacks children from 2 to 10 years of age. It is very exceptional to find it in both eyes, and it produces flat hard tumours, as mentioned above.

S. HANFORD MCKEE

Urology

The Lateral Pyelogram. Mertz, H. O. and Hamer, H. G., *J. Urol.*, 1934, **31**: 23.

The lateral pyelogram may easily be made in any urological examination and may be of great help in certain cases. It is made in the exact lateral position, the kidney to be examined being nearer the film. It will permit of a study of the following points: (1) the vertical position of the kidney; (2) the degree of rotation; (3) any antero-posterior displacement; (4) the outline of the pelvis; (5) the course of the upper ureter. The shadow of the normally placed pelvis in the lateral pyelogram is seen behind that of the 2nd or 3rd lumbar vertebra, its long axis corresponding to that of the spine. There is normally considerable variation in the amount of rotation of the kidney on its longitudinal axis, but any appreciable degree of rotation on its transverse axis is an evidence of disease. The shadow of the ureter has a slight convex curve anteriorly, and in the normal will lie behind the shadow of the lower half of the second, the third, and, at times, the fourth lumbar vertebra, then becoming anterior.

The lateral pyelogram may aid in the diagnosis of double kidney and ureter, and will show in bifid ureter the point of ureteral fusion, the degree of separation of the branches of the ureter, the relative position of the two pelves, and their relation to other shadows. It is of great value in the differential diagnosis of renal and biliary calculi. In the normal kidney a stone in its pelvis will cast a shadow behind the vertebræ, whereas a gall-stone will show out well anteriorly and usually lower. The shadow of a calcified lymph gland will be near the spine in both antero-posterior and lateral position, yet it will be anterior to the vertebræ on the lateral film. Again in the differential diagnosis of tumour in the upper abdomen the lateral pyelogram may be of much value. It is especially so in cases of early tumour where the ordinary pyelogram shows an indefinite defect; here a lateral pyelogram may disclose definite changes.

N. E. BERRY

Anterior Pituitary-Like Principle in the Treatment of Mal-Descent of the Testicle. Cohn, S., *J. Am. M. Ass.*, 1934, **103**: 103.

The anterior pituitary-like principle of pregnancy urine is apparently effective in causing the descent of the undescended testicle when there is no anatomical malformation to act as a mechanical obstruction. When an obstruction exists a partial descent will occur, but operation will be required to complete the process. In surgical cases anterior pituitary-like principle is a valuable adjunct in the production of a successful outcome.

The writer presents a series of 6 cases with reports on each. Four otherwise normal children were treated for mal-descent of the testicle with subcutaneous injection of anterior pituitary-like principle. Three patients experienced complete improvement. The fourth showed evidence of mechanical obstruction and will require operation. A fifth patient presented one side operated on, which furnished an admirable opportunity for a controlled observation, and gave evidence of pituitary hypofunction. Both the condition of the testicle and the general glandular hypofunction improved under therapy. The sixth patient was operated on again after several years, and the therapy was used as an adjunct to surgery. The result was entirely successful both as to the condition of the testes and the general condition of the patient.

V. J. BERRY

Neurology and Psychiatry

Dream Analysis: Its Application in Therapy and Research. Malamud, W., *Arch. Neurol. & Psychiat.*, 1934, **31**: 78.

Accumulated evidence supporting the value of dream analysis as an aid to the understanding and treatment of mental disease has reached a

stage where even the most sceptical can hardly doubt its utility. Most of the reported material, however, deals with dream analysis as an empirically established clinical procedure, and the view is now being promulgated that dream material may be of value not alone in clinical psychiatry but as a mode of studying human behaviour in general and the laws that govern it. The question which the author poses is whether material thus far obtained is valid for studies of this sort.

In a previous experimental study the author investigated the relation of recent impressions to the dream content. This was done by presenting pictures to the subjects, recording their reproduction of the details, and then searching subsequent dreams for relevant material. He found that not only were details omitted from the original reproduction present in the dream material, but that these omitted details had demonstrable relation to the life problems of the patient. These apparently "forgotten" details, had apparently, then, been stored up but were not reproduced (in the waking state). It was a logical assumption, then, that because of their connection with certain repressed factors in the life of the patient, these details were also repressed and only came out in the dream state.

The present article reports the results of further experiments testing the validity of the previous findings, and also investigates two additional features that had come to light in the earlier study. Similar experiments were performed, using a written passage in place of a picture, but the results obtained were disappointing.

The author summarizes his findings, after presenting some striking clinical material. (1) Details omitted or added in the reproduction of a given set of stimuli appear in dreams. The details as well as the dreams were related to the life problem of the patient. (2) The dreams following the experiment afforded clues to different problems of the given subject. Subsequent analysis showed that the dreams represented the attempts of the subject to deal with these problems. (3) The dreams also served to indicate the patient's reaction to analysis and the analyst.

G. N. PATERSON-SMYTH

Dilatations of the Cavity of the Septum Pellucidum and Cavum Vergæ. VanWagenen, W. P. and Aird, R. B., *Am. J. of Cancer*, 1934, **20**: 539.

The septum pellucidum is a thin, somewhat triangular, two-leaved membrane which separates in a vertical plane a portion of the two lateral ventricles. Embryologically, the cavum vergæ is the most posterior portion of the cavity of the septum pellucidum. Dilatations of the cavity of the septum pellucidum and cavum vergæ may be divided into three groups: (a) non-communicating, or those that have not established a fistula into the third or lateral ventricles; (b) communicating, or those that do have a fistulous communication with the ventricular system; (c) secondary or acquired dilatations, communicating in type, where the dilatation is but a part of the superimposed internal hydrocephalus from whatever cause.

Communicating dilatations do not produce clinical symptoms; non-communicating dilatations may cause mental changes, headache, vomiting, palsies, epileptiform seizures, diplopia, disturbed equilibrium, etc. Diagnosis of these latter cases may only be made by ventriculography. Treatment consists in establishing a fistula between the cyst and the anterior horn of the right lateral ventricle. The authors suggest that this might first be attempted by simple brain needle puncture of the cyst through the lateral ventricle, and should this not suffice a fistula can be made at operation.

FRANK A. TURNBULL

The Somnifaine Treatment in Psychiatry. Kooy, F. H., *South African Med. J.*, 1934, **8**: 567.

The treatment of psychoses by continuous narcosis is not entirely new, but the present method of *Dauerschlaf*, by daily injections of somnifaine during a fortnight, was only introduced by Kläsi in 1920. It consists of giving two or three intramuscular injections of 2 c.c. per day, the ideal case being the one that only needs two, one in the morning after the patient has breakfasted and has been attended to, and the other at night after his supper. If possible, one should aim at 16 to 20 hours' sleep in 24 hours, and at a semi-conscious state during the remaining hours.

Dr. Kooy has treated 133 cases of various types of mental disorders with repeated doses of somnifaine (Somnifene-Roche), thus producing a prolonged state of mild narcosis, in other words, a twilight condition. Forty-four of these cases were of the manic-depressive type and he obtained 29 cures in this group, and, while he had some good results in the other types, he concludes that the treatment is mainly applicable to the manic-depressive syndrome. He had five deaths, but points out that this number was well within the normal limits for untreated cases, and is thus inclined to regard this mortality rate as only apparent, not real. He kept his patients in the twilight condition for varying periods, the shortest three days, the longest fourteen days. He gives as the chief contra-indications: first, any organic disease; secondly, an idiosyncrasy on the part of some patients to somnifaine.

The chief complications which arose were bulbar symptoms, *viz.*, difficulty in swallowing and change in breathing. There was nearly

always a rise of temperature, with some vomiting and what the author calls suppression of urine, but which I take to be merely retention.

Dr. Kooy concludes his paper by suggesting that it is not alone the period of rest which the twilight condition gives that is responsible for the improvement and seeming cures; he suggests that somnifaine *per se* has some specific and beneficial action on the cerebrum. E. C. MENZIES

Dermatology

The So-called "Primary Complex" of Tuberculosis in the Skin. Bruusgaard, E., *Brit. J. Derm. & Syph.*, 1934, **46**: 113.

The portals of entry of the tubercle bacillus are first considered,—the lungs, skin and its neighbouring mucous membranes. In the disaster of Lübek, Calmette's vaccine, contaminated with virulent human bacilli, was given by the mouth, and the primary lesions were confined to the mouth, throat, œsophagus and gastro-intestinal tract. Multiple primary lesions were frequently found. The characteristic feature of infection occurring in a previously tubercle-free organism is the occurrence of a primary tuberculous "sore", plus a definite and often very pronounced swelling of the regional glands. There may be a marked lymphangitis. Although the primary sore may be insignificant in size, the draining lymph glands usually become very large and there is caseation.

The author reports 3 cases in males ranging in age from 5½ years to 8. In the first, the primary sore was at the left angle of the mouth. The cervical glands softened and discharged. Human tubercle bacilli were found. No evidence of tuberculosis was found in the chest, and all the family were apparently free. The Von Pirquet reaction was positive in the patient. In the second case reported the sore was on the middle of the right leg. Human bacilli were found. In the third, the primary lesion was on the right forearm just below the olecranon process. Tubercle bacilli were found in the primary lesion, but the type was not determined.

Primary tuberculosis of the skin is much commoner in Norway than in this country, but there are undoubtedly cases here in Canada which are being missed. NORMAN M. WRONG

Factors Involved in Leather Dermatitis. Beerman, H., *Arch. Derm. & Syph.*, 1934, **29**: 673.

Leather dermatitis is infrequent, the most common form being a hat-band dermatitis. There is nothing characteristic about the type of eruption, but the distribution may be of value in differential diagnosis. The author describes 4 cases. He then performed painstaking studies by means of the patch or contact eczema test, in order to find what substance in the preparation of the leather was responsible for the eruption. As the processes through which leather goes are complicated, this necessitated a great number of tests. The author concluded that the eruptions were due to synthetic tan stuff or to vat dye. He also concluded that a fungus infection may predispose to a leather dermatitis, or, conversely, a leather dermatitis may predispose to or reactivate a fungus infection.

NORMAN M. WRONG

Therapeutics

The Use of Calcium Ortho-Iodoxybenzoate in the Treatment of Arthritis, with a Discussion of Its Possible Value in Some Other Orthopædic Conditions. Wheeldon, T., *Ann. Int. Med.*, 1934, **7**: 1540.

Calcium ortho-iodoxybenzoate bears a close structural similarity to salicylic acid. It is not related to cinchophen, does not cause addiction in the patient, is relatively non-toxic even in massive doses, and may be combined with salicylates without fear of incompatibility. The author used this drug in the treatment of 282 cases of hypertrophic and atrophic arthritis, in the majority of which it was the only medication used. He gave 2 grains (four half grain tablets) daily, by mouth. The results, on the whole, were excellent. In many cases, they are recorded as startling. Many patients, who had been chronic invalids for months or years, were restored to useful activity.

The output of indican in the urine was found to be materially increased in nearly all cases, which suggests that an upset in the sulphur metabolism may be one of the underlying causes in arthritis.

The author believes that the beneficial action of the drug is due to its stimulating action on the peripheral circulation. He obtained striking improvement by the use of the drug in a group of cases comprised of Buerger's disease, varicose ulcers of the legs, and ulcerations of the legs from faulty circulation in acute anterior poliomyelitis. H. GODFREY BIRD

Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of the Thyroid in Patients without Thyrotoxicosis, with Particular Reference to the Pre- and Post-Operative Medical Management. Blumgart, H. L., Berlin, D. D., Davis, D., Riseman, J. E. F. and Weinstein, A. A., *Ann. Int. Med.*, 1934, **7**: 1469.

The object is to decrease the demands on the heart by inducing the low metabolic rate of hypothyroidism. Nothing less than complete removal of every vestige of thyroid tissue will do this permanently. The authors have operated on 60 cases with encouraging results. Only cases which failed to be relieved by prolonged and adequate medical treatment were subjected

to operation. Contraindications to operation are congestive heart failure that cannot be relieved by rest in bed, malignant hypertension, renal insufficiency, and active rheumatic involvement. The slower the progress of the disease, the greater and more permanent the improvement that may be expected following operation. Patients with a pre-operative basal metabolic rate of minus 15 per cent do not experience sufficient benefit to warrant operation.

Total thyroidectomy presents surgical difficulties in relation to the recurrent laryngeal nerves and to the parathyroid glands not inherent in the usual subtotal thyroidectomy. In the authors' series, parathyroid tetany, in the sense of convulsions etc., did not occur, although 12 patients showed manifestations of latent tetany, which were easily controlled by the giving of calcium.

Rest in bed for 3 to 4 weeks after operation is advisable, and activity should be only gradually increased. The extent of permanent relief is, in general, related to the degree of reduction in the basal metabolic rate. The optimum level is minus 25 to minus 30 per cent. If the basal rate falls to below this level annoying symptoms of myxœdema occur, which require small doses of thyroid for their relief.

H. GODFREY BIRD

Autogenous Vaccines in Rheumatoid Arthritis. A Clinical Study and Critique. Short, C. L., Dienes, L. and Bauer, W., *Am. J. M. Sc.*, 1934, **187**: 615.

The authors obtained cultures of organisms from 34 patients suffering from rheumatoid arthritis. From these cultures 102 vaccines were prepared. Forty-seven vaccines were made from strains isolated from the throats of the patients. Of these, 36 were non-hæmolytic streptococci, the rest various throat organisms. Forty-one strains were isolated from the stools, with 23 identified as *B. coli* and 14 as streptococci. Ten streptococcus strains were isolated from extracted teeth, and 4 from excised tonsils. With these vaccines 408 skin tests were made. The results were essentially negative, as very few patients gave tests indicating any degree of specific hypersensitiveness. Minor variations in skin reactions are explained upon the basis of varying irritability of the patients' skins and natural toxicity of the bacterial species. The authors' conclusions are that the different methods which have been recommended for the selection of specific vaccine strains are without a solid theoretical or experimental foundation, and that any therapeutic effect gained from such vaccines is a non-specific one. Finally, it is suggested that the allergic basis for rheumatoid arthritis is not justifiable on evidence from the interpretation of uncontrolled skin reactions with autogenous vaccines. E. S. MILLS

Pathology and Experimental Medicine

Massive Atelectatic Bronchiectasis. Warner, W. P., *Quart. J. of Med.*, 1934, **3**: 401.

The author presents an interesting series of 5 cases of bronchiectasis involving the whole of one lung, presumably with massive atelectasis of this lung. All the patients reported on are still living, so that pathological confirmation is lacking. One of the cases is considered to be of congenital origin, although the author is emphatic in declaring that, congenital bronchiectasis being a pathological curiosity, such diagnosis should only be made with a great deal of hesitation in patients more than a few weeks old (the patient reported on is aged 36). Another case was possibly due primarily to central bronchial obstruction, while it was considered that the atelectasis in the remaining cases was due to obstruction of the terminal bronchioles.

The author considers that bronchiectasis occurs without any fibrosis of the lung parenchyma and without any pleural adhesions, and has pathological proof of this in the lobe of a lung removed by operation. He considers that the primary fault is weakening of the bronchial wall, owing to destruction of the elastic and muscular coats from infection. Atelectasis of the involved portion of the lung, or of the whole lung, as in the reported cases, is an important factor in the production of the bronchiectasis, in that it greatly increases the negative pressure in this portion of the chest. It has been shown to be most often due to terminal bronchiole obstruction.

In all the cases reported the diagnosis was suggested by the plain x-ray appearance, there being thin, whorl-like shadows from apex to base, with the mediastinum shifted to the affected side. Lipiodol injection revealed saccular cavities scattered throughout the entire lung. W. FORD CONNELL

Morphological Varieties of Bronchiectasis in the Adult. Bendore, R. A. and Gershurin, B. S., *Arch. Int. Med.*, 1934, **54**: 131.

Roentgenological studies of lungs injected with iodized oil have made possible the study of bronchiectasis, both clinically and morphologically. This condition may be present without bronchorrhœa or cough. As regards the physiological function of the bronchi, there is, normally, definite movement, both a widening and a narrowing of the lumen, along with an elongation and shortening, produced by the myo-elastic layers of the wall. Obviously this plays an important part in pulmonary inflation and deflation. The expulsive mechanism consists of the cough, the action of the cilia, and this wave-like motion mentioned above. This reflex does not act in the smaller tubes and bronchioles. A condition that affects any of the

bronchial coats will affect the capacity to evacuate. Normally a bronchus rids itself of the oil in 20 minutes, so retention for longer implies a damaged bronchial wall.

Bearing in mind that various causes in the bronchi themselves and in the lung parenchyma may cause the radiological picture, the authors classify as follows bronchiolectasis and bronchiectatic abscess.

1. *Tubular.*—With lumen empty and walls outlined by the oil as it adheres to the diseased mucous membrane. This type has been associated with poison gas cases in the Great War.

2. *Cylindrical.*—Evacuative powers lost, walls stiff and inelastic; there are many variations in shape.

3. *Varicose.*—Caused by pulmonary fibrosis, with irregular traction on the bronchial wall.

4. *Bronchiolectasis.*—From same cause as (3); situated in deeper tissue.

5. *Globular or ampullar.* — Some think this syphilitic, apparently from an ulcer perforating the wall. X-ray picture shows the oil escaping into the cavity in the parenchyma. X-ray may show the level of the oil in the cavity.

6. *Primary bronchiectatic abscess.* — Often after removal of tonsils and adenoids, which become infected secondarily. There is also a group secondary to tumours and other forms of extra-bronchial pressure.

As regards the clinical picture of the different types: The tubular includes cough with expectoration easily raised. There are very few physical signs or constitutional symptoms. The cylindrical causes dyspnœa, distressing cough in the later stages, with a tendency to retention of purulent sputum and fever. The varicose type shows the picture of the lung condition that is causing the bronchiectasis, including displacement of the mediastinum: likewise in bronchiolectasis. The lung condition dominates. In the globular type a severe hæmoptysis may be the first sign. Diagnosis is only possible by bronchography. Bronchiectatic abscess often resembles lung abscess, or may run a more subacute course without typical physical signs.

Treatment with iodized oil is of use only in the tubular and early cylindrical types. Postural drainage is useful in some cases. Pneumothorax and surgery both have a distinct place in the treatment, and should be carried out where necessary as easily as possible.

P. M. MACDONNELL

Hygiene and Public Health

Elimination of Brucella Abortus with the Milk of "Carrier" Cows. Thompson, R., *J. Infect. Dis.*, 1934, **55**: 7.

Thompson points out that infection with *Br. abortus,* both in man and cattle, is widespread throughout Canada. It is, therefore, an important public health problem. As few goats are maintained in Canada for milking purposes direct infection from this source is unlikely. However, a more extensive study relating to other sources of infection would be opportune.

Thompson studied the milk of 10 high-producing cows which never manifested signs of infectious abortion, but in which the blood gave agglutination with *Br. abortus* in dilutions of 1:50 to 1:500. Cultures from the milk were made at intervals of thirty days over an entire lactation period by both the direct Petri dish method and the inoculation of guinea pigs. The author found that the method by inoculation of guinea pigs is slightly more efficient than the other for the detection in milk of *Br. abortus.* He also demonstrated the important practical point that *Br. abortus* may be constantly eliminated with the milk of cows classified as "healthy carriers".

JOHN NICHOLLS

Mortality Rates by Occupational Class in the United States. Britt, R. H., *Pub. Health Rep.,* 1934, **49**: 1101.

The 1930 census in the United States has permitted for the first time a satisfactory study of occupational mortality, and this study has revealed conditions of profound interest to students of public health. The death rates used are for 10 states. If the population of these states be divided into groups according to social classes, and death rates calculated on this basis, it is seen that the higher economic classes enjoy an immensely superior position to the lower classes with respect to general and specific mortalities for nearly every disease. This has been repeatedly demonstrated in English vital statistics but has not been so well shown before in the United States. The general death rate for professional men, aged 15 to 64 years, in 1930, was 7.0 per 1,000 of population; for unskilled workers it was 13.1. In the case of tuberculosis of the respiratory system the rates for the two classes per 100,000 were respectively 26.2 and 184.9. In the case of heart disease, cancer, pneumonia, and nephritis the difference in mortality is also very great. One class, agricultural workers, enjoy in nearly every disease mentioned the most favourable mortality experience of all gainfully-employed individuals.

Analysis of the figures by ages reveal, even in the younger ages, similar differences in mortality experience between the classes. In this study 5 classifications are used: professional men; proprietors, managers and officials; clerical workers; skilled workers and foremen; semi-skilled and unskilled workers. Comparison of these figures with those from England indicate a more marked differential mortality by class in the United States. With the exception of professional and business men, who tend to show a more favourable mortality experience than the same class in England, the other classes show on the whole a definitely higher mortality than in England.

FRANK G. PEDLEY

Obituaries

Dr. Herbert Melville Little, of Montreal, died suddenly on October 11th, aged 57 years. Dr. Little was born in London, Ont., in 1877 and took his Arts course at the University of Toronto. He was a graduate in Medicine of McGill University, 1901, and carried out his graduate studies at Johns Hopkins Hospital, the Montreal Maternity Hospital, the Tübingen Frauenklinik, at Munich, Vienna and Paris at various times between 1901 and 1908. He subsequently obtained the diplomas of member of the American Gynæcological Association, F.A.C.S., F.R.C.S.(C.) and F.C.O.G.(Eng.).

Dr. Little was a valued member of the Editorial Board of this *Journal* and of the Association.

We have received the following appreciation from Drs. Campbell Howard and A. H. Gordon.

"The sudden death of Dr. Herbert M. Little came as a great shock to the medical profession and to the public at large in Montreal and Canada. Seldom has there been such an outward and visible expression of the respect and love for one individual as was shown by his many friends from every walk of life at the funeral service, held on Saturday morning at Christ

Herbert Melville Little

Church Cathedral. Doctors, nurses, students and patients were there, of course, in greatest numbers. However, members of the Board of Governors of the University, and of both large hospitals were largely represented. The Bench, and the Bar, the Army, the Club and the Business World bowed their heads in respect. What was perhaps even more touching was the large number of his patients and their families from every walk of life who showed their loss and appreciation of his many past kindnesses, helpful advice and skilful care.

Shortly after Dr. Little entered the McGill Medical Faculty as a student in 1897 he made a place for himself in Montreal. He became interested in all forms of student activities, particularly in the McGill Cricket Club, where as 'Tiny Little' he was a universal favourite. Upon graduation in 1901 he went to the Johns Hopkins Hospital and served on the staff of the late John Whitridge Williams as intern, assistant-resident and resident until he returned to Montreal to take over the superintendency of the Montreal Maternity Hospital. There his enthusiasm and scientific training were soon recognized by the staff and Ladies' Board of Management and he was largely if not entirely responsible for the rapid growth and development of that institution.

Later he received an appointment to the Medical Faculty as an Assistant Professor of Obstetrics, and shortly afterwards (1913) was made an Assistant Gynæcologist to the Montreal General Hospital. A few years later he was promoted to full professorship at the University and was appointed Gynæcologist with the Montreal General Hospital. As secretary of the Medical Board of the latter institution he showed his great executive ability. He was a member of the Montreal Medico-Chirurgical Society, the Canadian Medical Association, and was first vice-president of the American Association of Obstetricians, Gynæcologists and Abdominal Surgeons. He was also a Foundation Fellow of the British College of Obstetrics and Gynæcologists. His social proclivities found vent in the Canadian Club, the University Club, and the Mount Royal Club, of Montreal.

Doctors as a rule do not live very long, and the age of fifty-seven would be an average one for medical men on this continent, and so Dr. Herbert Little would thus have reached his allotted span. But to those who knew him his life seemed scarcely to have begun. For he had the gift of exuberant youthfulness, which 'age could not wither nor custom stale'. The spirit of the boy never left him. That spirit that could throw a verbal missile at assumed dignity with the accuracy of a snowball striking the helmet of a fat policeman, was the same spirit which sent him tilting against tradition in his special field of surgery, and which won him a place among the first in his profession on this continent. A spirit like his made it impossible for him to be a Laodicean; no one ever found him lukewarm; hot or cold he was, and for or against, but never facing both ways.

The friends of his youth were the friends of his later years, and friendship with him was 'not a habit, it was a gift'. His friendship crossed all social, academic and racial boundaries; there was no group in which he was not at home, and none was so great in any group that he was safe from a shaft of his scintillating impudence. The keenness of his wit was a by-word among those who knew him, and in their *jeu d'esprit* it was his Parthian shot that oftenest ended the contest; yet one always forgot and forgave, because there was no malice nor meanness in his truly fine character. One trait which won him new friends and endeared old ones to him was his unfailing generosity. He was generous with his time, with his means, and with his influence to everyone whom these things might help.

These are some of the reasons why Christ Church Cathedral was crowded to the doors when people gathered to pay their last tribute to one who had in a moment been taken away. But another reason was that the man who had gone had given his life generously, as he had done of his other gifts, and that from him Judy O'Grady in her day of trouble had received the self-same care as had the Colonel's Lady, and with the care each had received a share of the cheer and love of life with which he himself was filled.

Like Matthew Arnold he was spared
'the whispering, crowded room,
The friends who come and gape and go;
The ceremonious air of gloom—
All, which makes death a hideous show!'"

Dr. Nelson Henry Beemer, of Toronto, who was for half a century Superintendent of the Ontario Hospital at Mimico, died recently at his home in Toronto, in his 83rd year.

Born in Waterford, Norfolk County, in 1853, Dr. Beemer was educated at Waterford public school,

Brantford High School, and the University of Toronto, from which he graduated in 1874.

For four years after his graduation he practised medicine in Wyoming, Lambton County, and in 1878 he was appointed assistant physician to the Ontario Hospital at London.

In 1886 he acted as Medical Superintendent of the Ontario Hospital at Hamilton, later returning to London, where he was Medical Superintendent until 1894. Then he was appointed Superintendent of the Mimico Hospital.

During his stay at London, he was examiner in mental diseases at Toronto University, and, for three years prior to 1928, he lectured in mental diseases to the medical school at Western University.

During the war he was honorary consultant of the Pension Board of Canada, and in 1924 was president of the Ontario Neuro-psychiatric Association.

He married Mary A. W. Laing, who predeceased him seven years ago, and is survived by two children, Arthur A. Beemer and Mrs. Edgar Day Knap, both of Toronto.

Dr. William Alexander Campbell, of Ponoka, Alta., died in Edmonton on September 6, 1934, after an illness of eighteen months, the result of cerebral thrombosis. In the death of Dr. Campbell the community loses a family physician of the type which is so fast disappearing; it loses a personal friend of the very highest quality; and it loses a man whom it has seen fit to honour politically.

Born on March 31, 1873, of Scotch-Canadian parentage at Naim, Middlesex Co., Ont., Dr. Campbell was educated in Strathroy public and high schools, the Jameson Avenue Collegiate Institute in Toronto, and graduated M.D., C.M., in 1899 from Trinity Medical College, Toronto. He practised for short periods of time in northern Ontario and in Ohio, and arrived in 1903 in the central Alberta town which he had made his home for over thirty years. In 1903 the Ponoka district was just being settled, and Dr. Campbell was an exponent of that very high type of practice which is required in a pioneer community where hospitals are far distant and consultations an impossibility. His large frame and robust physique made many hard trips a possibility, but the long hours and the difficult tasks left on him the marks of strain, which finally asserted themselves in the form of a stroke. Neither the difficult roads, the frost or blizzards, nor the financial condition of the patient made any difference, for the call was answered, and in the early days that frequently meant a trip of fifty miles over the open prairie.

Quite apart from the numerous friends made through his profession, his quiet manner, his genial disposition, and his activity in any good cause won for him the respect of all. He was a Past-master of the Masonic Order and a Past Grand in the Oddfellows.

When Alberta was organized as a province Dr. Campbell was elected as a Liberal to the Legislature, and continued to represent the Ponoka constituency until 1917, and he maintained an active interest in the welfare of the Liberal Party until his death. In his political capacity he, chiefly, was responsible for the choice of Ponoka as the site of the main Provincial Mental Hospital. Dr. Campbell was never married, but leaves to mourn his death, a brother in Georgia and two nephews, Donald and John Bell, of Ponoka.

A. SOMERVILLE

Dr. Aquilas Cheval died recently at St. Hilaire, P.Q., at the age of 72. He was a graduate in medicine from the University of Montreal in 1886.

Dr. J. Arthur Denis died on the evening of October 1st whilst on a fishing trip at Lac Rouge, in his 53rd year. He was born at Saint-Norbert, County of Berthier, studied at the seminary of Joliette, and took his medical degree at Laval University, Quebec, in 1906. Dr. Denis practised first at Notre-Dame-des-Bois, then settled in the northern part of Montreal. He had been Liberal member for St. Denis since 1921, and had been extremely active in political life.

Dr. Jean Paul Grenier. The medical profession of Quebec have just lost one of their younger doctors in the person of Dr. Jean Paul Grenier. Dr. Grenier died on September 24th at the early age of 39, and has left behind him a record of brilliant and promising career. He was born in the city of Quebec, graduated at Laval University, Quebec, in 1919, whence he went to New York and Paris for post-graduate courses and returned to practise in Quebec. He leaves a wife and two daughters.

Dr. John Caithness Innes, of Port Credit, Ont., died at his home on September 28, 1934, in his 85th year. He was born in Lawrence Kirk, Kincardineshire, Scotland, and graduated from Aberdeen College and Edinburgh University. He practised in Derbyshire, England, for a number of years, coming to Canada in 1904 and starting a practice at Port Credit. He retired 10 years ago. He was a Mason. Dr. Innes is survived by his widow, Anne Alethea Hoskyns, and two sons, Captains W. C. C. Innes, Port Credit, and J. P. D. Innes, Montreal.

Dr. David J. Johnston, of Iroquois, Ont., died on September 10, 1934. He was 73 years of age. He had practised for forty-seven years at Iroquois, where he was highly respected. He was a graduate of the University of Toronto (M.B., 1887). He was a brother of the late Judge Adam Johnston, who died in 1914 at Vankleek Hill; and of the late William Johnston, City Solicitor of Toronto. He is survived by his widow, formerly Miss Emma Larue; a brother, Thomas, on the homestead, Williamsburg; two sisters, Mrs. John Hepburn, Victoria, B.C., and Mrs. D. Currie, South Mountain; and two stepdaughters, Mrs. C. P. Shepherd, Campbellford, Ont., and Miss Marguerite Harkness, Iroquois.

Dr. Robert Unwin de Lotbinière Harwood, died during the last days of September, 1934, at Calgary, aged thirty-two, after an illness of some weeks. Dr. Harwood was a native of Pincher Creek, Alta., the son of Mr. and Mrs. J. W. de Lotbinière Harwood, and a cousin of the late Dr. Louis de Lotbinière Harwood, of Montreal.

Dr. Harwood was a graduate of Alberta University and a Ph.D. of McGill. He had been working for some years in the Department of Biochemistry of McGill University, and with the Department of Medicine of the Royal Victoria Hospital.

He is survived by his father and mother; and two sisters, Margaret Harwood and Mrs. Herman Emmalkamp; also by two uncles and an aunt, C. A. Harwood, K.C., Dr. A. C. Harwood, and Lady Steel, of Montreal.

Dr. John Alexander Macleod, of Kingston, Ont., passed away suddenly in Kingston from heart failure on August 20, 1934. He graduated from Toronto University in medicine in 1907. Later he practised his profession in Massey, Algoma, Allenford and Orangeville. For the last ten years of his life he was in the service of the Ontario Government, being a member of the medical staff of the Hospitals at Brockville, Mimico and Kingston. Quiet and unassuming, he was respected by all who knew him, and beloved by his patients.

He was born in Prince Edward Island, the eldest son of the late Rev. Donald Macleod. His boyhood was spent in Ontario, and he attended public school in Priceville, and later the Owen Sound Collegiate, before going to the University.

Dr. Frank Porter, of Waubaushene, Ont., died on September 4, 1934, in his seventy-fifth year. He was a graduate of Trinity University (M.D., C.M., 1898). His wife, formerly Sarah Elma Clapp had predeceased him.

Dr. Thomas L. Ryan died suddenly on September 7th after spending 34 years of practice in Saginaw. He was born at Walton, Ont., in 1870, attended St. Jerome's College at Kitchener; then the University of Western Ontario, graduating in Medicine in 1899. Immediately after graduation he married Miss Emily McMahon and located in Saginaw. He is survived by his widow, a son and a daughter, three sisters, Mrs. M. Phelan, of Blyth, Mrs. M. Cleary, of Seaforth, Mrs. K. Nolan, of Brussels, and two brothers, P. Ryan, of Detroit, and Jno. Ryan, of London.

Dr. Stephan Stephanson, of The Pas, Man., died in the Winnipeg General Hospital on September 18th. He was born in West Selkirk, Man., in 1886, the son of Stephan Bjornson, a pioneer of that district. He graduated in medicine from Manitoba Medical College in 1912 and engaged in private practice until 1919, when he entered into partnership with Dr. Robt. D. Orok, of The Pas, and with him was put in charge of all medical work in connection with the Hudson's Bay and Flin Flon Railways. When the Flin Flon medical service was organized in 1929 Dr. Stephanson entered it along with three other doctors. He remained in practice at The Pas until 1933, when he went to Flin Flon. He was a staunch Liberal, was president of the Liberal Association at The Pas, and in 1927 was an unsuccessful candidate for the Manitoba Legislature. On July 23rd of this year he was stricken with acute appendicitis and Dr. B. J. Brandson, of Winnipeg, went by air to Flin Flon in consultation. Two weeks later Dr. Stephanson was brought by plane to the Winnipeg General Hospital. He was married in 1915 to Miss Anna Emery and is survived by his widow and two sons, Norman and Arnold.

Dr. Henri Trudel died on September 16th at Saint-Grégoire at the age of 80, after having practised for over half a century in that town. He was born at Saint-Geneviève de Batiscan, and graduated in medicine from Laval University, Quebec, in 1878.

News Items

Alberta

A special meeting of the Council of the College of Physicians and Surgeons and the members of the out-going and in-coming Executive Committees of the Alberta Medical Association was held in Red Deer, October 4, 1934. One object of the meeting was to strengthen organized medicine in Canada, nationally and provincially, in order that the public and the profession might both be benefited. The idea was that provincial associations would take on the name of the National Association and be branches of it; that a basic constitution be drawn up by the Canadian Medical Association on which all the provinces could agree; and that they also furnish a skeleton constitution for the provincial branches. Provision would be made in the skeleton constitution for meeting the local provincial needs, thus basically, all the provinces would be united, but individually they would not be hampered in dealing with local matters. After some discussion the general principle was adopted by the following resolution.

> "That the members of the out-going and in-coming Executive Committees of the Alberta Medical Association and the members of the Council of the College of Physicians and Surgeons of the Province of Alberta, in joint meeting at Red Deer, October 4, 1934, express their endorsement of the general principles involved in the proposal that the Provincial Medical Association of Alberta become a branch of the Canadian Medical Association and be known as the Canadian Medical Association, Alberta Branch."

The Province of Alberta is nothing if not progressive in medical matters, and created a precedent by inviting the Past-president and the present President of the Alberta Medical Association to sit in at all the meetings of the Council and have all the rights and privileges as members of the Council except the right to vote. This latter of course is not provided for in the Medical Act.

At the next session of the Legislature of Alberta it is contemplated that a detailed Health Insurance Act will be passed, making it possible for municipalities to know what they are voting on, if a plebiscite be taken. Some people fear that malingering on the part of patients who enjoy hospitalization (or poor health) may wreck the scheme or put too great a responsibility on the attending physician, to discharge a hospital patient. The following resolution was passed at this meeting.

> "That from the inception of the Health Insurance Scheme, provision be made for the appointment of a Board whose duty shall be, in case of dispute, to decide the amount of medical or hospital treatment the patient in question is entitled to receive."

G. E. LEARMONTH

Manitoba

The Medical Superintendent and members of the Sanatorium Board of Manitoba attended a complimentary luncheon to Dr. R. E. Wodehouse, Deputy Minister of Health, on September 15th at the Central Tuberculosis Clinic, Winnipeg.

Dr. Ross Mitchell addressed the Grand Forks Medical Society at Grafton, N.D., on September 19th on the subject "The late toxæmias of pregnancy".

Mr. Hugh N. Wolfenden, Mr. C. C. Ferguson, Managing Director of the Great West Life Assurance Company, and Mr. M. D. Grant, Associate Manager of the Sovereign Life Insurance Co., addressed a gathering of Winnipeg medical men at a luncheon in the Fort Garry Hotel on September 24th on "The relations of the medical and actuarial professions to health insurance".

ROSS MITCHELL

New Brunswick

The Provincial Department of Health have begun their annual physical examination and x-ray examination of chests in the normal schools and universities of the province. They have just completed the examination of the pupils in the normal school in Fredericton, and will subsequently examine those in the University of New Brunswick, Mount Allison, and St. Joseph's Universities. This routine physical and x-ray examination of the chests of these pupils began in 1927-28, with the idea of case finding. Lately, a five-year follow-up of potential cases of tuberculosis has been undertaken in the hope of arriving at the average incidence of this disease in this particular age-group of supposedly healthy persons. The total enrolment in the various institutions averages 800. The work is done through the New Brunswick Department of Health by the tuberculosis diagnostic service and health officers.

Diet in Pregnancy

THE mother's diet, during pregnancy and lactation, ought to include:
2 pints of milk daily.
1 or 2 substantial servings of green vegetables—cabbage, spinach or lettuce—daily.
1 or 2 eggs or egg yolks daily.
An apple or orange or some fresh fruit daily.
Sea fish twice or more a week.
Calf's liver once a week.
If cod-liver oil can be taken, 2 teaspoonfuls daily is advisable.
The rest of the diet can be made up as the woman wishes.—DR. EDWARD MELLANBY, in *Lancet* (Lond.), Nov. 18, 1933.

ALPHAMETTES

A simple medium

for cod liver oil therapy

During pregnancy, the need for greater vitamin A and D intake is generally accepted, in order to build up a reserve for the developing fœtus and to lower the maternal risk of puerperal pyrexia. Unfortunately, there are many patients who cannot, or will not co-operate when advised to take cod liver oil. Alphamettes present a logical and simple solution to this problem. Alphamettes, being a defatted concentrate of cod liver oil in capsule form, are easy to take, and being defatted, cause none of the gastric distress sometimes associated with cod liver oil by "the teaspoonful".

Each Alphamette exhibits the complete vitamin value of three teaspoonfuls of cod liver oil conforming with requirements of the U.S.P. X (1934 revised), and retains the same vitamins A and D ratio that long clinical experience has established as being sound and practical.

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Pharmaceutical and Biological Chemists
MONTREAL - - CANADA

Coincident with the re-opening of the schools, the New Brunswick Department of Health is continuing the inoculation of rural school children with diphtheria toxoid. As usual in this province, all children entering school for the first time must present a certificate of successful vaccination against smallpox.

During the past summer, New Brunswick, with the rest of the country, has suffered a comparative drought, but nothing to be compared with less favoured portions of the Dominion. However, water supplies have somewhat shrunk and a small number of typhoid patients have lately appeared in the various centres, but nothing that could be considered an epidemic.

Dr. L. J. Austin, Professor of Surgery in Queen's University, made a short visit in Saint John towards the middle of September. He addressed the Saint John Medical Society on September 14 on the subject of "Carcinoma of the colon". The attendance at this meeting was large, as Dr. Austin has made himself many friends in New Brunswick. His address as usual was interesting and instructive. His racy manner of presenting facts and personal experiences brings to his addresses an interest which is never failing.

Discussion was lead by Dr. Albert Macaulay, and many others followed with questions and remarks. The following day Dr. Austin gave a fracture clinic in the Saint John General Hospital, which again attracted a large number of medical men.

Dr. H. B. Bustin, medical inspector of schools in Saint John City and County, has left for Toronto to take a year's post-graduate work in the University of Toronto under a scholarship provided by the Connaught Laboratories. Dr. A. M. Clark, of Bathurst, travelling tuberculosis diagnostician, is attending the same institution under a Rockefeller foundation scholarship. These scholarships will qualify them for the diploma of public health.

Dr. E. W. Lunney, chief anæsthetist at the Saint John General Hospital, is at present in Montreal undergoing medical treatment. Dr. Lunney has been absent from his duties for some time owing to ill health.

A. STANLEY KIRKLAND

Nova Scotia

Dr. J. E. LeBlanc, of West Pubnico, was awarded one of the special Jacques Cartier Memorial Gold Medals by Count Robert deCaix, special Envoy of the French Government. This award was made in recognition of his efforts in promoting a higher standard of education in literature and science among the Acadians. Dr. LeBlanc was completely taken by surprise. As far as is known he is the only Nova Scotian so honoured by the French Government.

At the 10th Annual Maritime Hospital Association meeting held at the Technical College, Halifax, several speakers, including Drs. G. H. Murphy and G. H. Agnew, advocated compulsory group health insurance. The value of such a measure in aiding preventive medicine was stressed by the speakers.

Dr. R. A. MacLellan, of Rawdon, brought an action for libel against the Rev. F. Somer, and was awarded a verdict with damages.

Dr. Jean Whittier accompanied her sister Dr. Catherine Whittier, to Indore, Central India, where she will undertake medical missionary work.

Dr. J. N. Mack celebrated his 90th birthday on September 30th. He has been in retirement for some years, but still enjoys good health.

Dr. Arthur M. Marshall was married on September 19th at Columbiano, Ohio, and Dr. F. A. Minshull returned to Halifax a few weeks ago following his wedding trip. Both have resumed practice in the city.

Dr. G. A. MacIntosh, Superintendent of the Victoria General Hospital, sailed from Halifax to New York and Philadelphia where he will spend some days.

Dr. Lavina McPhee passed away at Brickton, Annapolis County, at the age of 65, after many years of ill-health. She was a graduate of the University of Manitoba. Before coming to this province seven years ago she had engaged in practice in Vancouver and Iowa.

N. B. DREYER

Ontario

Dr. George A. Bingham, Professor of Clinical Surgery and Clinical Anatomy, University of Toronto, died in 1922. The will of his widow has been recently filed for probate. The principal gift is to the Toronto General Hospital, provision being made for the purchase of a site for the erection and maintenance of a home for convalescent patients, to be a memorial to her husband, for which a sum of probably $300,000 will be available. Other provisions are $2,000 to the Hospital for Sick Children, $1,000 to the Home for Incurable Children, $25,000 to the Women's Missionary Society of the United Church for the erection and equipment of a hospital at Matheson, Ont., and $5,000 to the Alumni Federation of the University of Toronto for loans to needy students in the Faculty of Medicine.

Thirteen of the living past-presidents of the Ontario Medical Association, the Committee in Consultation, held their first gathering on October 4th, with Hon. Dr. J. A. Faulkner, Minister of Health as guest, to discuss matters of public health of mutual interest to the Provincial Department and the Association.

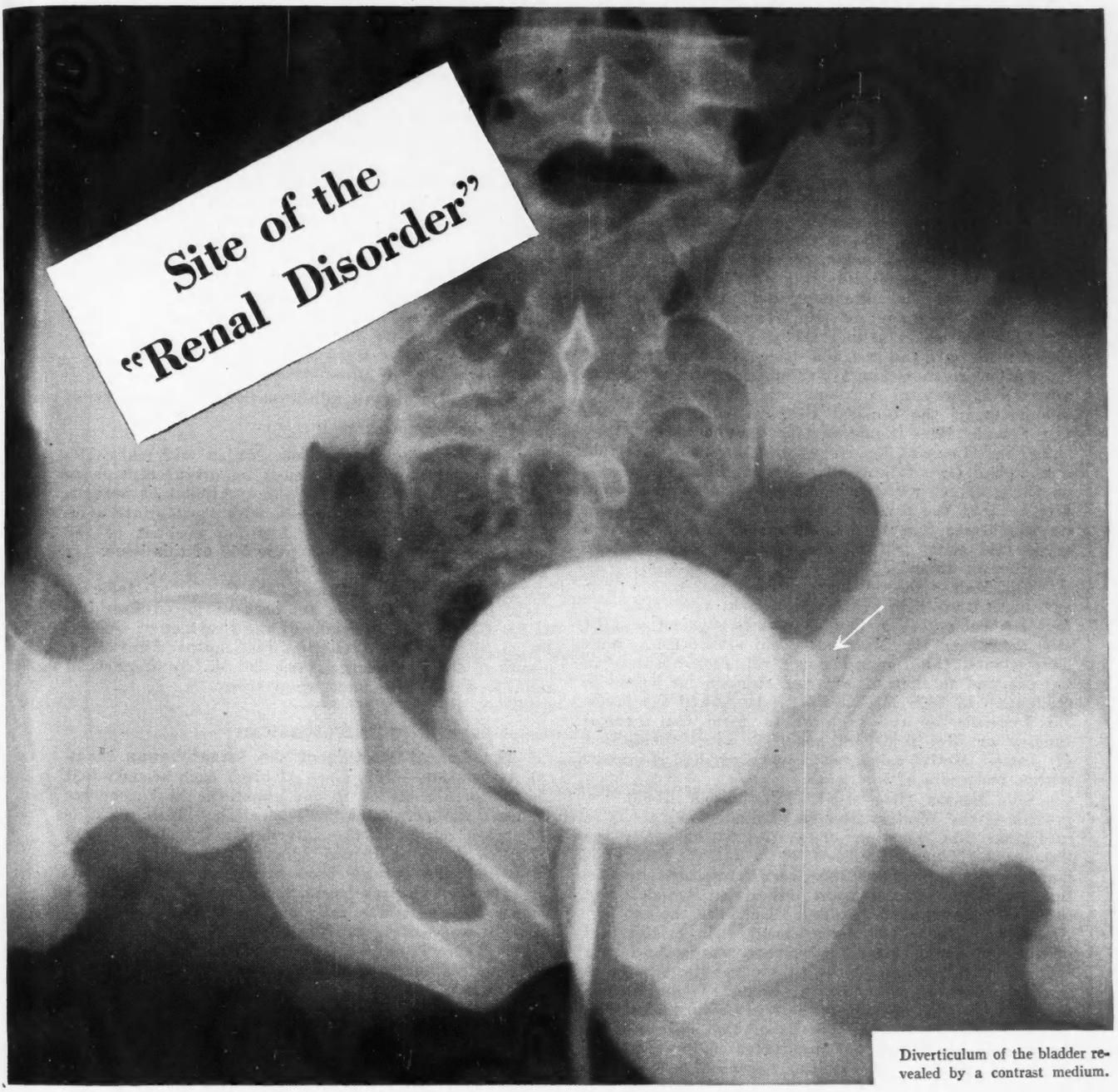
The 6th Annual Post-Graduate Course at St. Michael's Hospital, given in September, was an unqualified success, with upwards of 80 physicians outside the city and many local practitioners in attendance.

The local Board of Health of Toronto has approved of the establishment, as a general convalescent hospital, of the Hastings Memorial Wing of the Riverdale Isolation Hospital. It will be available for city order patients for the general hospitals and may be ready by November 1st.

A refresher course for public health nurses in industry, planned by the School of Nursing in cooperation with the Department of University Extension, University of Toronto, was held from October 24 to 27.

A completely equipped dental office on wheels, said to be the only one in operation anywhere in the world, and with a fully qualified dentist acting in the dual capacity of chauffeur and practitioner, is serving the dental needs of children in sparsely settled sections of northern Ontario, in addition to looking after the requirements of adults on relief. It is being developed and maintained by the Government of Ontario.

J. H. ELLIOTT



Diverticulum of the bladder revealed by a contrast medium.

CONDITIONS that appear clinically to indicate a renal disorder may be the symptoms of diverticuli of the urinary bladder. Proper treatment or surgical intervention, however, requires accurate diagnosis.

Radiographic examination is an accurate and most important diagnostic measure even in cases that vaguely suggest pathology of the urinary bladder. Cystograms aid in the visualization of any diverticuli that are present . . . their size, shape, number, and relation to the bladder wall may be shown. The gross condition of the bladder wall—whether the dilatation is of the small neck retention or large neck non-retention type—can be determined.

Refer your cases evidencing indefinite urinary dysfunction to your radiologist. His radiographic findings will serve as a guide to proper treatment or surgical interference.

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CANADIAN KODAK CO., LIMITED,
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Quebec

The new pavilion of the Western Division of the Montreal General Hospital, for the use of private patients, was formally opened by His Excellency, the Governor-General, on October 5, 1934.

Arriving at the main entrance just before noon Lord Bessborough was received by the president of the Montreal General Hospital, Lieut.-Col. Herbert Molson, the governors and board of management, and the medical board, the latter headed by Dr. F. S. Patch, Dr. J. C. Mackenzie, general superintendent of the Montreal General Hospital, Dr. B. Johnston, assistant general superintendent, and Dr. A. Lorne C. Gilday, superintendent of the Western Division.

Col. Molson in asking the Governor-General formally to declare the pavilion open, said that they had been proud to show him a building that was a distinct advance in hospital construction. He traced the development of the General Hospital from 1818 when the Female Benevolent Society founded what they called the House of Recovery with four beds. He told how it had been followed by the purchase of a house on Craig Street with accommodation for 25 beds and how in 1821 the present site of the Central Division on Dorchester Street was purchased and the cornerstone laid with full masonic honours by the then Governor of Canada.

Col. Molson showed how, by easy stages, the present institution had grown, and mentioned that the first medical school in Canada was established in 1824 and known as the Montreal Medical Institute, with 25 students, the General being the first hospital in Canada and in fact in America to open its wards to students. In 1828 McGill University asked the Medical Institute of the hospital to form the medical faculty of McGill as, in order to avail themselves of James McGill's bequest, teaching had to start within ten years of his death.

Col. Molson then went on to speak about the growth of the Western Hospital founded in 1874. He said that the question of amalgamation with the General had been discussed by different boards of management as early as 1905, but it was only in 1920 that the charter was obtained authorizing it and it was not consummated until January, 1924, when the two hospitals came under one management. He briefly told of the increasing need for private wards, and said that by the erection of the present pavilion a great deal of space in the hospital proper would become available for public and semi-private wards and patients would receive the benefit of the most modern equipment, which was not duplicated in any way.

In conclusion, Col. Molson expressed his thanks to Dr. Bazin, to the architects, engineers and contractors for what he described as "a good and honest job, well conceived and well carried out."

Addresses were also given by Hon. Athanase David, Provincial Secretary and representatives of the mayors of Montreal and Westmount.

The recently completed Jewish General Hospital on Côté des Neiges Road, Montreal, was formally inaugurated on October 9, 1934. Mr. Michael Hirsch presided.

The actual opening was done, with a golden key, by Hon. Athanase David, Provincial Treasurer, on behalf of Premier Taschereau, who was unable to be present; while the Governor-General of Canada, Earl Bessborough, with a silver trowel presented to him for that purpose, well and truly laid the last stone of the building, and unveiled a memorial plaque in commemoration of the event.

The Governor-General spoke of the "spirit of charity characteristic of Jewry throughout the world"; Hon. Athanase David spoke of something more important than money, "the spirit that you have put into your building"; Mayor Camillien Houde spoke of the lesson that all can learn from Jews, of solidarity and community spirit.

The tablet unveiled by the Governor-General bears the following inscription:

A TRIBUTE EVERLASTING

His Excellency
The Earl of Bessborough, P.C., G.C.M.G.
Governor-General of Canada,
Who on August Third,
Nineteen Hundred and Thirty-one
Turned the first sod
Completed the Building of this the
JEWISH GENERAL HOSPITAL
By inserting in place the last stone
on the Eighth day of October,
Nineteen Hundred and Thirty-four
Tishri 29—5695.

This hospital will admit patients irrespective of race or creed.

The Neurological Institute, which will make McGill University one of the most important centres on this continent for the study and treatment of nervous disorders, was formally opened with appropriate ceremony on September 27th. A fuller account of the proceedings can be found on page 555 of this issue.

Dr. P. C. Dagneau, Dean of the Faculty of Medicine, Laval University, Quebec, has been re-elected *President* of the College of Physicians of the Province of Quebec. Dr. J. E. Laporte, Joliette, was chosen *First Vice-president*, and Drs. George Hume and M. Laroche, *Second* and *Third Vice-presidents*, respectively.

Saskatchewan

The Annual Meeting of the Saskatchewan Medical Association.—This piece of birch bark seemed just the thing to write on to you about the Saskatchewan Medical Association Annual meeting. This place is 342 miles north of the international boundary and 70 miles north of Prince Albert.

Ninety-four of the boys turned up for the meetings; lots of them brought their wives. Every bite we ate, unless it was fish, and every drop we drank, unless it was water, was brought in by trucks, seventy miles. There is only one phone in the place; all calls are long distance; so it was a paradise for doctors. There was no blackboard at the front with numbers to be called.

The business meetings were the usual thing, Dave Johnstone protesting that things were not being done according to the constitution and the rest of us glad to get them done anyway; Sam Moore giving his report on State Health Insurance, and the boys getting restless after the first hour of it. Dakin made a couple of good speeches. Finally a committee was appointed with members from both the Council and the Association. This committee is to tackle the government to try to make them see that a doctor is just as much of a necessity as clothing, even if not so decorative. We had a grand trip across the lake in motor boats to the wiener roast. The business meeting continued in the evening. Everyone said what a terrible thing it is to be a municipal doctor, and how badly the municipal doctors were paid, and what they could do to prevent doctors from underbidding each other in their frantic efforts to get these jobs.

There was a lively dance that night and other entertainments far into the night, so Urban Gareau did pretty well to be telling us at 9 a.m. how to treat summer diarrhœa in children. The first thing, he says, is to procure two good nurses. In our experience the kind of family that can pay two good nurses is the kind that boils the baby's milk and does not get diarrhœa.

Acute and Generalized Staphylococcal Infections

Staphylococcus Antitoxin

From various sources there has been an accumulation of evidence which suggests that much of the symptomatology of acute staphylococcal infections is attributable to liberation of staphylococcus exotoxin within the body. The serious nature of such infections would appear to be due in large measure to the highly pathogenic effects of staphylococcus exotoxin upon living cells and tissues. Consequently, the use of staphylococcus antitoxin has been advocated in the treatment of acute and of generalized infections where there is evidence that Staphylococcus pyogenes is the causal micro-organism. (See the issues of this Journal for June, July and August, 1934.)

As prepared by methods evolved in the Connaught Laboratories, Staphylococcus Antitoxin consists of refined and concentrated globulins from the blood-serum of horses which have been immunized against pooled toxoids and toxins of several selected strains of staphylococcus. Beneficial results have followed administration of this antitoxin in ACUTE CARBUNCLE and in CELLULITIS, OSTEOMYELITIS, MENINGITIS and SEPTICAEMIA, where staphylococcus has been the infecting agent.

Staphylococcus Antitoxin (Refined and Concentrated) has been made available by the Connaught Laboratories in 25 cc. vial-packages.

Prices and information relating to the use of Staphylococcus Antitoxin will be supplied gladly upon request.

CONNAUGHT LABORATORIES
University of Toronto
TORONTO 5 - - CANADA

Kirkby, from the P. A. San., just back from the Old Country, where he has been taking post-graduate work, said that 20 per cent of childhood infection of T. B. is due to unpasteurized milk; as long as the sale of unpasteurized milk is profitable who will worry about the children?

Deaths from appendicitis seem to be about as plentiful as those from cancer, but people don't talk about it half as much as they talk about cancer, Munroe, from Edmonton says there should be more education of public opinion. Philadelphia has started a campaign and Alberta is copying it.

Hunter, from Winnipeg, talked about errors in diagnosis. We had never met Hunter before, though he usually comes to Regina in consultation when a prominent person is about to die. You say, "How is Mr. X. today?" and someone says, "Hunter is here to see him". It gives one quite a nasty shock. "Poor chap, I'd no idea he was as sick as that". Hunter writes out his speech, lays it on the table, and talks. "History", said he, "is the backdrop of diagnosis. When you're puzzled, take a fresh, detached view of the case. In a chronic cough, look out for bronchogenic carcinoma; it's getting more common. Look out for cancer of the stomach and cancer of the rectum. The difference between an internist and a G. P. is that the internist sticks his finger in the rectum. Look for cancer of the prostate and for diverticulitis. Don't be content with a diagnosis of sciatica; x-ray the pelvis. Look out for intercostal neuralgia; it's not a very good diagnosis. Another thing that creeps up on a person and you can miss is subacute bacterial endocarditis. The patient is tired, anæmic, running a slight temperature and is below par; in these cases examine the spleen; we don't look often enough for the spleen; an enlarged spleen is no part of a decompensating heart. There must be infection or a complication; or an embolus will hit the kidney and there will be blood in the urine. In abdominal pain, tense the abdominal muscles and look for the tender spot. Look for early paralysis agitans; the patients don't move on one side when walking; we're too pessimistic with these people; use hyoscine and make them keep moving. Look for pernicious anæmia in its early stages; give liver as a therapeutic test, even if you can't find blood changes. Look for myxœdema; the patients have cold clammy skins and feel the cold; you don't need a basal rate to diagnose it. In all cases remember to examine the ductless glands."

Fahrni, of Winnipeg, kept on about appendicitis. He was trying to persuade the boys, when a patient has a ruptured appendix and general peritonitis, to wait till it localized before they go in. Most of the lads felt that they lacked courage to wait. He also said to leave a mass alone, that is, after the appendix has ruptured. It seems they are doing it in Winnipeg; after the general peritonitis subsides, the appendix can be taken out in three months, but not before.

Irwin, of Swift Current, reported a case of full-term pregnancy in the tube. The reason he missed the diagnosis in the early stage was that the woman had terminated the previous pregnancy in an induced abortion; he felt that she had tried the same thing this time. On examination there was pain and tenderness in both fornices, which he thought was due to infection. He kept her in hospital a while, then she went home, she went to term, but did not deliver. At operation they found a macerated fetus which weighed 6½ pounds.

Matheson, of Gull Lake, gave a well-prepared paper on "Some diseases of the ano-rectal region", and Lindsay, from the University of Saskatchewan, gave a good paper on "Present-day problems of malignancy".

The Prince Albert Medical Society were hosts at the annual banqeut held at Lakeview Inn. The snake room was well patronized, and everyone was in a good mood. The assembled guests stood at attention as the orchestra played the King when the Lieutenant-Governor entered in full dress with decorations, all the same as the Englishman in the tropics dressing for dinner every night; but one did thrill a bit at the dignity of the Empire being upheld in the farthest north regions. In his reply to the toast to the guests the Lieutenant-Governor mentioned the isolation of the male sex hormone and its practical application. We wonder why, with twenty years longer than women, men are so nostalgic about the passing of youth. Uhrich was the fluent, spell-binding orator; he mentioned falling T. B. death rates with pride, while George Ferguson in the audience, looked modestly effacing. Peterson, of Saskatoon, was biting, incisive, and condemning of all government health schemes. Hugh McLean, of Regina, talked of ideals. Hugh never takes a drink. Judge Knowles was robustly Rabelaisian. Emmet McCusker was charmingly gallant in his toast to the ladies, but no amount of persuasion would make him give "Narcisse". Lillian Chase in replying to the toast to the ladies, gave some true stories of practice.

It was hard getting up to listen to Joe Brown first thing in the morning. His speech was clear, systematic, and easy to follow. It seems we don't have enough radium in this province to treat cancer of the cervix properly, or that's what we gathered. The politicians will probably deny this.

Ernie Myers gave a good, clear discourse, too. He must have taught school some time. Sandy McMurtry said there were contraindications to taking out tonsils, but did you ever refer a patient to a nose and throat man and have him send the patient back, saying, "This man does not need to have his tonsils out?"

Alexander, of Saskatoon, talked on "Intra-abdominal hæmorrhage"; his patients must enjoy looking at him.

Dr. J. W. MacNeill, head of the Battleford Mental Hospital, spoke at the lunch and again on behaviour problems. First thing we know, mental health will be as important in this province as T. B. Dr. Ferguson had a good many of his staff at the meetings; he sees that they get to England for post-graduate work and insists that they keep up on things, even if they are working for the government.

A good idea about reading was given us by Hunter. He takes about twelve of the best medical journals, keeps them at home, does not bind them, but stacks them, subscribes to the Cumulative Index, and any time he wants to look up a point, with the index and the magazines he can look it up in the evening in the peace and comfort of his own home.

We're off to the Cy March to see the beaver dam.

Waskesiu, Sask. BLUE OWL.

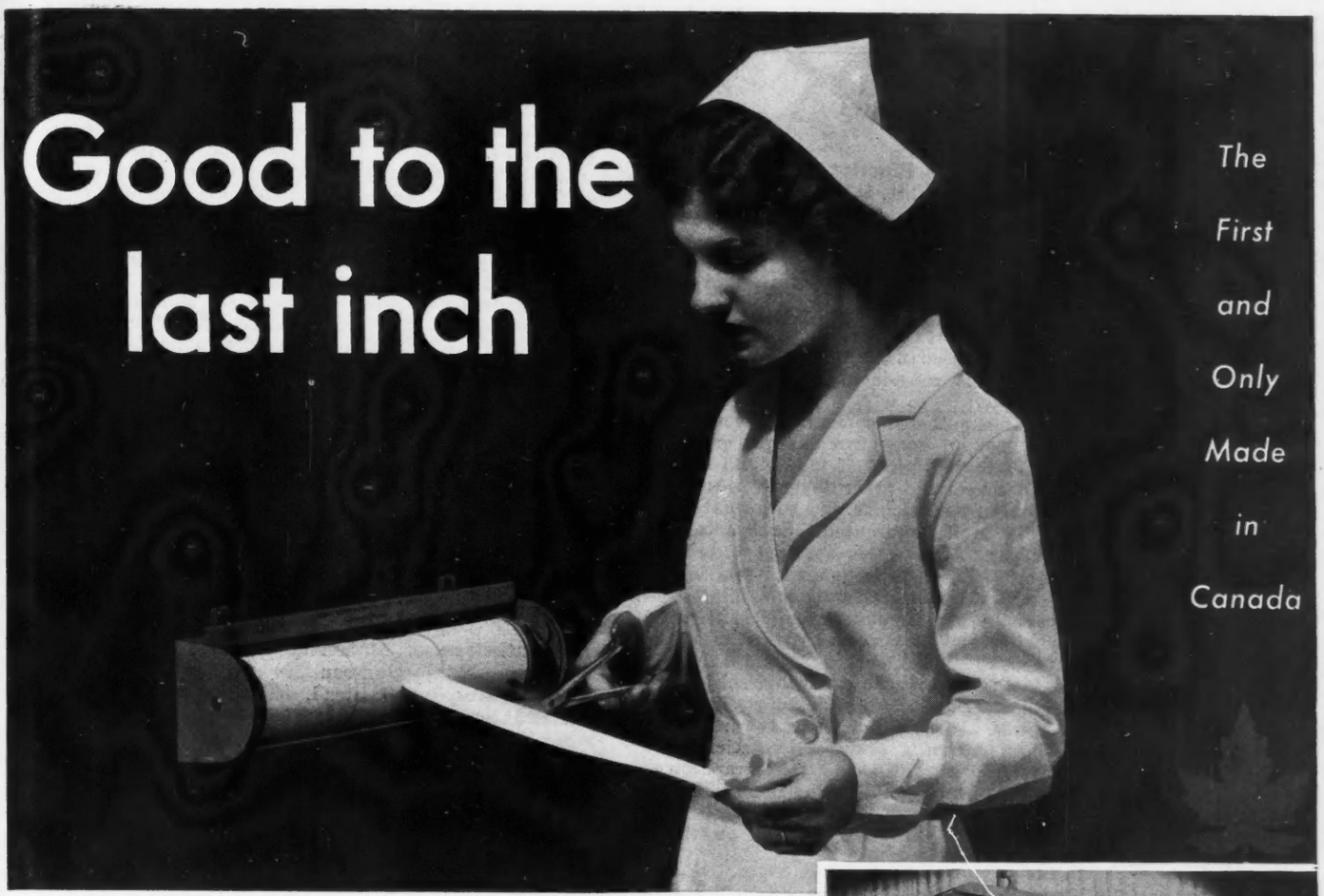
Dr. P. L. Straith was presented with a silver platter at the September meeting of the Regina and District Medical Society. Dr. Straith, who has practised in Regina for ten years, and has been president of the medical society and a member of the provincial executive, will leave many friends when he goes to take up his new practice in Courtnay, B.C. LILLIAN A. CHASE

General

The second annual reunion dinner of The University Veterans' League will be held in the Royal York Hotel, Toronto, on Saturday, November 10th, to commemorate Armistice Day.

From coast to coast, veterans of all Canadian universities and men who served with university units will be there, and it is expected that last year's attendance of 1,000 will be greatly exceeded.

Lieut-Col. Geo. A. Drew, K.C., is to be the principal speaker.



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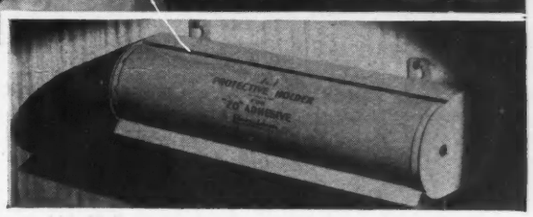

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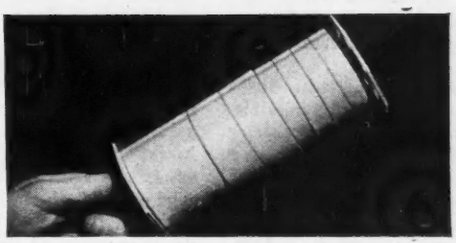

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Book Reviews

Modern Treatment in General Practice. Edited by C. P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E. 426 pages. Price $3.45. Medical Press & Circular, London; Macmillan Co., Toronto, 1934.

For many years the *Medical Press and Circular* has done its bit towards helping the general practitioner by publishing a long series of articles on many phases of medicine. These were written by men who may be designated by the much-abused name, specialist, and in concise terms tell what is considered the present-day view of treatment.

The editor has now gathered some three score of these papers into a book of some five hundred pages. The contributors come from all parts of the British Isles and are outstanding teachers and practitioners. Most of them are physicians and pædiatricians, but surgeons and dermatologists are also well represented. Each article averages about eight pages, and is therefore not so brief as to be scrappy nor so long as to be tedious. The subjects covered are mostly those of paramount interest, such as diabetic coma, acute circulatory failure, treatment of early syphilis and rheumatoid arthritis, but rarer conditions are also included, such as cœliac disease and "pink disease". Nor have the debatable subjects been forgotten. Collis (Dublin) discusses the clinical significance of erythema nodosum, and leans toward the recent theory that it is often a skin manifestation of tuberculosis. Percival (Edinburgh) has a monograph on pigment-formation in the skin and Whittle (Cambridge) discusses the common fungi of the skin.

On the whole, an excellent book to have on the library shelf within easy reach.

Surgery of a General Practice. Arthur E. Hertzler, M.D., Chief Surgeon, Halstead Hospital, and Victor E. Chesky, M.D., Chief Resident Surgeon, Halstead Hospital, Kansas. 602 pages, illustrated. Price $11.50. C. V. Mosby Co., St. Louis; McAinsh & Co., Toronto, 1934.

This is a new book based upon a "Minor Surgery" which had gone through a number of editions. The senior author has long been a champion of the general practitioner. It is pointed out that there was less cry about the high costs of medical care when the latter did more of it!

The authors give one treatment and, as a rule, one only, and give it in a manner which inspires confidence. This is in most refreshing contrast with the guessing-game methods of some other writers in the same field. Special emphasis is placed upon the early recognition of surface malignant conditions by the man who should see them first.

The book is well printed, and splendidly illustrated. Its style is crisp, and for the most part pleases on the subjects with which it deals. It does not pretend to cover the more uncommon conditions.

In this country fractures form an important part of the surgery of general practice, yet this "Surgery of a General Practice" treats only fractures of the ribs and, slightly, those of the skull. To Canadians this is a major omission. An irritating feature is the repeated prescription of drug preparations by names which are neither found in the pharmacopœias nor accepted by the Council of the American Medical Association in New and Non-official Remedies.

Cinchophen is recommended in *twenty* grain doses every three or four hours for traumatic teno-synovitis. Surely the tragedies following the use of that drug which have been reported in our own *Journal* as well as that of the American Medical Association at least warrant reasonable caution.

These writers, and others, should explain why a boil on the lip must be treated with extremely cautious gentleness, and yet, when dealing with an acute alveolar abscess, with very similar relationships, it is quite the correct thing to inflict the trauma of tooth extraction. The practitioner may some day need to know the reason.

Around St. Louis "it is the exception for patients with exudative pleurisy ever to show evidence of tuberculosis". Lucky St. Louis! Certainly the contrary is true here. While not advising it, the book countenances the use of an ordinary hypodermic needle for exploratory puncture. Many of us believe that a diagnosis of pleural effusion arrived at by ordinary clinical methods would be quite as dependable as one made by such an insufficient procedure. The writers affirm that when the inguinal glands are swollen, one may determine the site of the infection by their position. Gray's Anatomy of twenty years ago considered that idea obsolete.

Some little errors should have been caught before the book was released. For example there is one in the chapter on Sporotrichosis. This condition, of which we know little in Canada, receives a prominent place. The sporothrix is said to be an anaerobe, yet it is treated as though it were intensely aerobic. Fortunately, this is the case.

The many good features of the book earn it a place in the library, but the general practitioner who expects it to cover all his surgical needs will be disappointed.

Surgical Pathology of Mammary Gland. Arthur E. Hertzler, M.D., Surgeon to Agnes Hertzler Memorial Hospital, Halstead, and Irene A. Koeneke, M.D., M.Sc. Med., Resident Gynæcologist, Halstead Hospital, Kansas. 283 pages, illustrated. Price $5.00. J. B. Lippincott, Phila., London, and Montreal, 1933.

This book is the fifth of Dr. Hertzler's series of monographs on surgical pathology. In the introductory chapter he ably discusses "The Fundamental Problems in the Diseases of the Mammary Gland", "The Social and Subjective Importance to the Patient of her Mammary Glands", and "The Surgeon's Obligation to Women with Breast Complaints". He then goes on to deplore the lack of knowledge concerning the changes, normal and abnormal in the breast and the general failure of the surgeon to fulfil his obligations. These criticisms might well have been omitted. Surgeons and pathologists generally have a keen appreciation of the anatomical variations and the significance of the pathological lesions of the breast.

In the succeeding chapters the anatomy, physiology, pathology, and prognosis of the various diseases of the breast are presented and discussed in a practical manner. In the two very important chapters on the connective tissue and parenchymatous changes, particularly the latter, the author points out that the interpretations of the findings lead to a great many errors in diagnosis and the sacrificing of many innocent breasts. This we must admit. It is a difficult problem and for this reason the chapters on "Parenchymatous Hyperplasia and Preclinical Carcinoma" might well have been given more consideration at the expense of the chapters on operable and inoperable carcinoma, interesting and intriguing pictures though they may present. A greater effort to distinguish between the obviously benign and the more neoplastic and dangerous lesions in parenchymatous hyperplasia would greatly enhance the value of the book and help the surgeon and pathologist to avoid the very mistakes of which the author complains so much.

With reference to the unnecessary removal of breasts involved in parenchymatous hyperplasia the author makes some very objectionable statements. For instance, "The poor subdued pathologist might find something that suggests malignancy" and "The monthly salary cheque has attuned the vision of many a pathologist to the discovery of at least a tiny malignant area". Whatever may have been the unfortunate experience of the author, no such condition exists in this country. We pathologists are employed to help the surgeon; not to cover up his mistakes. The writer has never met with anything but appreciation on being

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unable to confirm the clinician's diagnosis. We would probably all enjoy Dr. Hertzler's books more if he would refrain from so many insinuations of this nature. They in no way add to our knowledge of the subject under discussion and simply add to the burden of reading an already voluminous publication.

The Management of Fractures, Dislocations and Sprains. John A. Key, B.S., M.D., Clinical Professor of Orthopædic Surgery, Washington University School of Medicine, and H. Earle Conwell, M.D., F.A.C.S., Orthopædic Surgeon for Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. 1164 pages, illustrated. Price $16.50. C. V. Mosby, St. Louis; McAinsh & Co., Toronto, 1934.

This book is divided into two sections. The first contains ten chapters and is devoted to general considerations, and the second, comprising seventeen chapters, deals with the diagnosis and treatment of specific injuries.

The first section takes up the classification, pathology, and general principles of the diagnosis and treatment of fractures, dislocations and sprains. A considerable portion of the text is allotted to the various types of apparatus commonly in use in the treatment of fractures. They are described in detail with good photographs and in some cases, actual measurements are given. Two very important chapters are incorporated in this section. One is devoted to the Workmen's Compensation Board and gives a general outline of its workings. The other chapter takes up the medico-legal aspects of fracture cases.

The second section deals with the diagnosis and treatment of injuries in specific regions. The methods of diagnosis are carefully described and treatment is gone into in detail. A considerable portion is devoted to prognosis and to the finer points of after-treatment which are so important in securing good results. It is rather gratifying to note the increased space devoted to injuries of the hand and foot. Too often, this portion of the subject seems to be left to the last, so that it really contains very little information. In this volume, one hundred pages are devoted to injuries of the hand and seventy to injuries of the foot.

The text is written in an easy running style, but this is never allowed to interfere with clarity of description. The illustrations and letter press are good. It should make an excellent book, not only for the general practitioner but also for the surgeon who has a large industrial practice.

Obstetric Medicine. Edited by Fred L. Adair, M.A., M.D., F.A.C.S., Mary Campau Ryerson Professor of Obstetrics and Gynæcology, and Edward J. Stieglitz, M.S., M.D., F.A.C.P., Assistant Clinical Professor of Medicine, University of Chicago. 743 pages, illustrated. Price $8.00. Lea & Febiger, Phila., 1934.

The questions "What effect does the pregnancy have on the disease?" and "What does the disease do to the gestation?" propounded as points of view, each in relation to mother and fetus, advanced during the course of the author's introduction, are in the opinion of the reviewer well and sufficiently answered in the succeeding chapters.

The book is divided into twelve sections; the first concerning normal gestation, physical diagnosis, pharmacology thereof, and fetal disorders, and the succeeding eleven each dealing with diseases or disorders of the various systems of the body with relation to pregnancy. Each chapter is presented by a man well competent to write in his special field. The relation to and effect of disease on pregnancy, as well as prophylaxis and treatment, are clearly and thoroughly described, with intersectional references and a bibliography at the end. To us in Canada, the chapter on tropical diseases may seem unnecessarily complete. The international scope of the book may, however, warrant its inclusion. The chapter on skin diseases seems abrupt and inconclusively treated.

The book will prove a welcome addition to the library of each practising or consulting obstetrician. Moreover, to the general practitioner who desires a ready authoritative reference, or who is unable to seek the aid of a specialist, this volume will prove of invaluable assistance.

Practical Treatise on Diseases of the Skin. Oliver S. Ormsby, M.D., Clinical Professor and Chairman of Department of Dermatology, University of Chicago. Fourth edition, 1288 pages, illustrated. Price $11.50. Lea & Febiger, Phila., 1934.

This edition thoroughly reviews and brings up to date the material of previous editions. Descriptions of several new diseases are added and many others are rewritten. There is nothing to take exception to in the arrangement and general writing. One looks in vain, as one would look anywhere in vain, for new information regarding eczema, and yet one cannot but feel that by a determined effort some of the numerous varieties might be reduced to a common heading. There is, on the other hand, everything to praise in the quality of the illustrations, on which a dermatological work depends so much.

A Student's Handbook of Clinical Electrocardiography. William Evans, M.D., M.R.C.P.(Lond.), Assistant Physician and Assistant Director of the Medical Unit, London Hospital. 49 pages, illustrated. Price 5s. H. K. Lewis, London, 1934.

The electrocardiogram so often forms a part of the medical history of a patient that the proper interpretation of it should no longer be left to specialists. This little book, although primarily intended for students, is of great help to older men who graduated some years ago. It is eminently practical, dealing with tracings that are characteristic of heart changes, and leaving out disputed questions entirely. At the end of the book there is a series of exercises to test the student. With this volume mastered, neither the student nor practitioner will be impressed with the mystery that often clouds electrocardiography. It is really a laboratory course on a very interesting clinical subject, which every one should understand.

The Merck Manual of Therapeutics and Materia Medica. Sixth edition, 1379 pages. Compiled and published by Merck & Co., Rahway, N.J., 1934.

This well known publication, designed as a hand book of ready reference for the busy physician, has now reached its sixth edition. In it the subject treatment is approached not only as a science but as an art; the patient is not forgotten. The etiology, diagnosis, and treatment of 257 pathological conditions are given in alphabetical sequence. Many more chapters have been added, bringing the subject matter up to date. Among the many general subjects dealt with are prophylaxis, regimen, diet, therapeutic technique, differential diagnosis, physiological standards, official and non-official remedies. There are many useful tables and some 2,000 prescriptions, which will delight the "practical man". The publication is an exceedingly useful one, full, accurate, and dependable. It can be obtained from the Merck Company.

BOOKS RECEIVED

The Patient and the Weather. Vol. 3. Mental and Nervous Diseases. William F. Petersen, M.D., and Margaret E. Milliken, S.M. 375 pages, illustrated. Edwards Bros., Inc., Ann Arbor, Mich., 1934.

The Complete Pediatrician. Wilburt C. Davison, M.A., D.Sc., M.D., Professor of Pædiatrics, Duke University School of Medicine, Duke University Press, Durham, N.C., 1934.